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HEALTH IN AFRICA

HEALTH IN AFRICA

A Medical Handbook for European Travellers and
Residents, embracing a Study of Malarial Fever
as it is found in British Central Africa

BY

D. KERR CROSS, M.B., C.M., F.R.G.S.

Medical Officer for British Central Africa Protectorate

WITH AN INTRODUCTION BY

SIR HARRY JOHNSTON, K.C.B.

H. B. M.'s Commissioner for British Central Africa Protectorate

WITH NUMEROUS ILLUSTRATIONS

London

JAMES NISBET & CO., LIMITED

21 BERNERS STREET

1897

44-11500

RC81
C88

Printed by BALLANTYNE, HANSON & Co.
At the Ballantyne Press

NOV 21 1944

PREFACE

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THE following pages have been written with the desire of helping, in however small a degree, those who live on the outskirts of civilisation in Africa. After a residence of fully ten years in British Central Africa as a medical man, I have been impressed with the need for a small handbook on health, written with little attention to technical expression, yet with such acumen and detail as will be appreciated by the intelligent. Surely it is unwise for young men to go out to malarial countries, like the Central African continent, without the knowledge of the nature of "fever" and allied troubles, and without knowing how best to protect themselves against the same. *It is equally unwise to be without the necessary medicines.* The majority of those resident in Central Africa are stationed a long way—sometimes a week's journey—from a medical adviser. They are thus, by the exigencies of their position, compelled to acquire some knowledge of medicine. Then, in the eye of the African every European is a doctor, and at any moment may be called upon to minister to a needy native.

These pages are written in the hope of helping the following :—

- (1) The government official who comes in direct contact with the people.
- (2) The non-medical missionary who must be the physician to his own community.
- (3) The coffee-planter who is compelled to do something for the sick among his employees.
- (4) The merchant trader who may be stricken with fever in his store or while travelling in distant places.
- (5) The traveller, the miner, and the engineer.

Little originality is claimed for the chapters. In writing I have

culled information from every source at my disposal, this only influencing me to accept or reject it: would the information be useful for elucidating the subject to those whose mission is in a malarial country.

Malarial fever has been made the subject of special study. This is the *one disease* that forces itself on the attention of all, even of the most indifferent. No one escapes fever. This chapter has been written for the intelligent reader who wants to know what "fever" is; what is going on when the system is convulsed in ague; what are the varieties of fever found in Africa; what the sequelæ, and, above all, what is the best treatment. One is often surprised at the intelligence manifested on medical themes by those resident in Africa, and can only attribute this to the peculiarities of their situation.

A full index has been deemed a necessity.

Is it too much to hope that this little book will become a companion to some Europeans in Africa, and that its pages may be consulted with profit?

D. K. C.

GLASGOW, *May* 1897.

INTRODUCTION

THE man who can teach us Europeans to maintain our health in Central Africa will solve the most important question connected with the Dark Continent. Dr. David Kerr Cross has been for some ten years engaged in medical work at the north end of Lake Nyasa, in the British Central Africa Protectorate, and no medical man of my acquaintance is so fully versed as he is in the study of African diseases. He returns to Central Africa as one of the medical officers in the service of the British Central Africa Protectorate, but, before starting, has, at my suggestion, compiled the most useful and interesting manual to which I venture to affix these few words of recommendation.

Central Africa under present conditions is *not* healthy. The Highlands are better than the Lowlands, but the land has to be very lofty in altitude to be above the fever zone. Yet the vast countries which lie between the Tropics in Africa are—most of them—richly endowed with sources of wealth. As a rule, the land is fertile and well watered—markedly so compared with Central Australia and many parts of South America. The rocks contain precious metals and precious stones. The forests furnish timbers, gums, drugs, and dyes of value. The animal world provides us with beautiful furs, with hides, ivory, and wax. The human population, living mostly in a state of savagery, attracts the attention of missionaries of many forms of Christian doctrine who desire to raise the negro to an appreciation of civilised life and to a definite religion. How are these sources of wealth to be tapped, how are these works to be carried on, if the European pioneer cannot retain his health?

Dr. Cross's manual will teach those who study it, how to avoid

disease, and how to combat it when it is unavoidable. It is not the last word on the subject : men may adopt his remedies and follow his suggestions and yet be vanquished by the African climate. But this manual is, I believe, a step in advance of the few pre-existing works on African Hygiene—mostly written by medical men whose experience of Tropical Africa was much less than that of Dr. Cross. I therefore recommend all Europeans about to settle in Tropical Africa, to read Dr. Cross's manual, and follow as closely as may be the advice therein given—advice with which I wholly concur.

H. H. JOHNSTON.

May 1897.

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HEALTH IN AFRICA

CHAPTER I

HYGIENE; OR, THE PRESERVATION OF HEALTH

It is now admitted by every writer on Hygiene, that the climate of a country has a marked effect on the health, spirits, and character of its inhabitants; it therefore becomes all those brought up in a temperate climate, and who find themselves suddenly transported to tropical heat and life, to carefully study the laws of health, so as to ward off those bodily weaknesses and diseases to which they are exposed.

In order to maintain health in the tropics, special attention must be paid to—

Food.—By food is meant everything that is taken into the system to maintain the healthy discharge of its functions. Milk is a perfect food, in that it contains in perfect proportion all that is necessary for the maintenance of health. The food of a healthy person is usually a mixed diet, and contains quite a variety of nutritious ingredients. The different foods may be classified as follows :—

- (1) **PROTEIDS OR NITROGENOUS FOODS**, such as meat, flour, eggs, and cheese.
- (2) **FATS**, as oils; animal and vegetable fats.
- (3) **AMYLOIDS**, which comprise sugar, rice, sago, bread, arrow-root, potatoes.
- (4) **SALTS**, as common salt and phosphates.

In addition to the above, ordinary water, and mineral waters containing various chemical substances, enter largely into the composition of the food. From 60 to 80 ounces of fluids, in the form of tea, coffee, and water, are taken every day into the system.

A large part of the solid constituents of the body consists of proteids, which are always undergoing oxidation, and the oxidised products are constantly being excreted in the urine as urea and uric acid.

Milk from the cow is the most digestible of milks. Goat's milk contains 4.2 per cent. of fat, 4 per cent. of milk-sugar, and 3 per cent. of casein. It is richer in cream, but poorer in proteids than cow's milk. Asses' milk is most nearly allied to the human, and is therefore the most suitable substitute for the mother's milk which can be given to very young infants.

Meat as an article of diet should only be partaken of in the tropics twice within the twenty-four hours, and then only with moderation, and should always be carefully and well cooked. The digestive organs are more delicate in the tropics than in the temperate regions, and are not so resistant to an overstrain. Heavy luncheons should always be avoided. As far as possible discard all tinned meats, and, above all, tinned fish. The flesh of the native goat is infinitely better and cheaper than any form of tinned meat. Should one be forced to open a tin of fish, the whole should be partaken of at one meal, and if any is left over, it should be disposed of. Low forms of life germinate in tinned fish with remarkable rapidity.

Fruits in their season when fully ripe are always good. Oranges, mangoes, ripe bananas, guavas, papaws, and the juice only of the pineapple, can be partaken of freely during the day, but should not be partaken of at night.

As regards the use of alcohol in the tropics, the question is one that has been fiercely debated, and even now is a vexed question. It is admitted on every hand, that, provided suitable food is procurable, the majority of men can maintain perfect health without alcohol in any form. All admit that the stronger forms of alcohol, unless freely diluted with water, are prejudicial to health. Alcohol dilates the vessels of the skin, so that it lessens bodily heat by radiation. It increases the action of the heart for the time being, but this is quickly followed by a period of depression. Large quantities of spirits paralyse the nerve centres; while small quantities, by increasing the blood supply, stimulate mental activity. In small quantities it induces sleep. This, however, should be clearly stated: in no climate is it necessary for the maintenance of health, and should on no consideration whatever be touched till the work of the day—with its worry and fatigue—is over. Considering, too, the awful hold alcohol has on certain constitutions, slowly undermining every noble trait, it would be well to discard spirits absolutely as a common article of diet.

Tea, coffee, and cocoa are excellent drinks in hot climates. It should, however, never be forgotten, that thirst, and the habit of relieving it by imbibing fluids, are largely a matter of education and habit. The drinking of large quantities of water is always injurious, especially when one is heated after a long fatiguing journey. Never take a big drink of water from a running stream when you are hot, or you may fall insensible.

Exercise.—As in temperate climes, so in tropical, the amount of exercise and rest in sleep which are necessary for the maintenance of health in the individual, are largely the result of habit. No rule can be laid down, but, speaking generally, it is a fact that the amount of sleep partaken of is in excess of the requirement. It seems also to be true that residents in the tropics require more sleep in hours than those who reside in temperate regions. Sleep should never be indulged in after a hearty meal.

The best time to take exercise is in the early morning shortly after sunrise. During these hours the air is cool and balmy, the body fresh, and the mind active and susceptible of impressions.

Most people take a quiet siesta during the day, and this is necessary. Rest is generally taken from 12:30 to 2 P.M. It should be made a rule, that, including the quiet noonday time of rest, nine or ten hours out of the twenty-four should be given to sleep.

In the tropics it is doubly unwise to turn the night into day. No amount of sleep taken during the day can compensate for the loss of calm rest at night. The unavoidable noises, the heat, the light, rob the nervous system of the tranquillity so necessary to refreshing sleep.

The tendency in the tropics is to lead a sedentary life, and this is more injurious to the system than in the temperate zone. Every man must fight this tendency, and take a due amount of exercise suitable to his own constitution. Of all exercises an early morning ride before the bath is best.

Clothing.—We clothe ourselves to protect the body against cold and wet and wind, and to retain the natural bodily heat. Man has this power given him in contrast to all other animals, and it enables him to brave all climates.

In the tropics, for months at a time, the temperature of the air exceeds that of the body (98.6 F.); consequently the circulation in the skin is increased, and there is a balance between the evaporation and radiation, which results in the temperature of the body being maintained. We require clothing, therefore, not as in temperate zones, to retain the natural bodily heat, but to protect the skin from the external heat, and allow a free evaporation from the

same. A resident in the tropics should be always so clothed that he is proof against sudden chills from changes of temperature. Look upon the sun as an enemy, and never go into the direct rays without having the head covered by a pith helmet. If forced to stand for a short time, while bathed with perspiration, throw some extra garment over the shoulders and so avoid a chill. In fact, if you want to preserve your health in a changeable climate like that of Africa, you must to some extent be prepared to coddle yourself.

The material of the dress is important.—Dress should always be chosen so as to maintain, as nearly as possible, an equable temperature, retaining natural heat, and resisting external heat and cold. *Cotton* is admirably adapted to warm climates, except when the body is covered with perspiration. Linen, on the other hand, is very cold, does not absorb or retain moisture so freely as cotton, and does not soil so readily. Very often in Africa the skin is simply bathed in perspiration, even when the most ordinary duties take up the attention. It is therefore most necessary to guard against chills of every kind. I would therefore recommend that fine flannel be worn next the skin, by day and by night, in order, as far as possible, to maintain an equable temperature. If the wearing of flannel should tend to set up prickly heat, as it does in some constitutions, then a linen garment should be worn underneath the flannel to protect the skin. If one should be travelling on the hills in the cold season, an additional flannel shirt should be worn. This point settled, I would recommend that white cotton suits be worn in addition to the flannel under-garments. Colour influences the absorption of heat, and it is well known that white garments absorb heat least of all. A proper head-dress is an absolute necessity. It should be light in weight and white in colour, should afford shade to the eyes and covering to the back of the neck, and should allow a free current of air to pass over the top of the head. A good helmet is therefore as much as a man's life may be worth when under a tropical sun.

Suitable foot-gear is also a necessity. When the hot season is upon us, shoes are to be preferred to boots. Boots should be made of soft and pliable leather, and, while large and roomy, should be a good fit.

In Africa it is important to protect the region of the abdomen from the constant chills.—For this purpose the flannel belt or "Kāmārbānd" is usually worn. It should be made 10 inches broad, 6 feet long, and of the best unshrinkable flannel, and should encase the abdomen, being wound round the waist at least twice. It should be worn loose. If it is made narrow, and drawn



tightly round the abdomen, perspiration will be retained on its upper edge and under surface, and so will neutralise its good effects.

All over India "putties" are used as an article of clothing, and might well be adopted in Africa. They are worn over the trousers, give support and protection to the legs, and are most comfortable. They are simpler and better than leather leggings, which are often found to press on the ankles.

A *mosquito curtain* is indispensable for Africa. Mosquito bites are sometimes a source of great trouble, especially to all newcomers, giving rise to considerable œdematous inflammation of the eyelids, neck, hands, arms, and ankles. They set up a most violent irritation which leads to scratching, and it may be to tearing and bleeding of the tissues. Look upon mosquitoes as enemies, as they are the intermediate hosts of quite a number of low forms of life that live in the lymphatics and blood of man. This is specially so in some parts of Africa where certain species of mosquitoes abound. It may also yet be proven, that all our malarial troubles are due to these blood-sucking insects. For a single person a mosquito net should be about 7 feet in height, 7 feet in length, and $3\frac{1}{2}$ feet in breadth. The top should be made of linen cloth and not netting, and the curtain should be of closely woven hairy netting, so that even the smallest mosquitoes cannot find an entrance. It will save a world of after trouble, to get such a net, to use it from the first day of African life, to be most careful that no stray insect has gained an entrance before you retire, and that you make it a rule never to sleep in Africa without a curtain.

The house.—The selection of a site for a house is a much more important matter in the tropics than in temperate regions, inasmuch as the question of malaria enters so largely into the affair. Most eastern towns are, for obvious reasons, built on the banks of rivers, and built in the worst situations possible. Clay slate rocks usually afford a healthy site for a house, as they do not retain water. Trap rocks, metamorphic and granite, are also good, as from them water runs off more or less rapidly. Limestone rocks, chalk without clay, are usually good. If, however, chalk has an under-strata of clay, it is likely to be cold, damp, and malarious. Sand, if it is pure, and of considerable depth, is usually healthy, as the water cannot lie and afford a nidus to malarial life. Clay soils, being impervious, usually retain water, and are consequently malarious.

The lower storey of a dwelling-house should be raised so as to be clear of the ground, unless it is made absolutely impervious to damp by the finest cement. It should be a rule that the sleeping

room, if not cemented, be at least 10 feet above the soil. The under-floor could be utilised for ordinary rooms or stores, but the sleeping apartment should always be raised. To the neglect of this rule, together with the use of sun-dried bricks in building, may be traced much of the fever and some of the deaths, which have occurred in Central Africa.

Every room in the house should have a fireplace, and a good log fire should burn brightly every day. It is not necessary to have such for the heat, but it dries the air and ventilates the room. If it is not possible to have a fire within the house, then a good fire should burn at night on the verandah, opposite the door of the sleeping room. Fire is the enemy of malaria. Every dwelling should have an eight-feet-in-width verandah all round, and should be well ventilated to keep off the hot air. Every dwelling, too, should be supplied with pipes, gutters, and eaves, to convey the rain-water from the foundations of the house.

Ventilation.—Pure atmosphere is of the utmost importance. It is well known that the native African seldom suffers from chest complaints, and this is largely due to the fact that he lives in the free air and sunshine, and enters his house as seldom as possible. His house is built to sleep in—he lives in his village. Pure air is secured in dwelling-houses by ventilation, that is, a stream of pure oxygenated air is allowed to enter the room, and to replace the vitiated atmosphere, which is loaded with what, to man at least, are impurities. The air we expire is largely devoid of oxygen, and loaded with carbonic acid and organic matters. Then the surface of the skin is constantly giving off a variety of impurities; there are, too, hosts of microscopic life arising in every room from a thousand sources; dust is abundant in all atmospheres; gases are given off from the candles we burn, &c. &c.—all these tend to make the air of a room impure, and demand that a current of fresh atmospheric air be supplied. That the air of a dwelling is impure is not always apparent to the senses of those resident in the room, but is abundantly so to those who have enjoyed the freshness of the open air. The former have had their senses dulled. Nature has provided us all with the most delicate instruments in the sense of smell and touch. That the air is vitiated is most apparent in the early morning if one is called upon to enter a bedroom which has been occupied for the hours of night by one or more sleepers, and if the doors and windows have been closed. On entering such a room one instinctively wishes to draw back, feeling uncomfortable.

Ventilation is the means by which this heated, moisture-laden, foul air is removed, and pure air allowed to take its place. If

a fire is burning in a fireplace, then the currents set up purify the air in a wonderful manner. Nothing ventilates a room better than an open fire with a free chimney; currents from every corner of the dwelling are constantly in motion firewards, while fresh air enters to fill up the vacuum. This fresh air enters by the doors, the windows, and even through the walls themselves. A continual diffusion of gases is thus going on, causing the air of the room to be constantly changed.

The one thing here to be avoided in the admission of fresh air in abundance, is draughts. The problem must always be solved without any current of air acting injuriously on the system, or playing on any one part of the body, so as to reduce its vitality. In Africa this is sometimes very difficult, and is doubtless that which weakens the body and exposes it to an attack of fever. Fever is often brought about by a cold. In every case study the room, and place the bed in such a position, that no current of air from the door or window will pass over the sleeper. Screens will here come into requisition. The window and door are of course the best means of airing a room. As long as draughts are avoided, too much air cannot enter a room. In the early morning throw wide the doors and windows, air the coverings of the bed, and let nature drive away every impurity. There are two things that low pathological forms of life cannot stand, and these are fresh air and sunlight.

It is absolutely necessary to study to avoid draughts.—Now, it is obvious that if a window is open at the bottom, it will create a current of air about the level of the sleeper, and if open at the top, this will be lessened. It should be laid down as a rule, that when allowing air to ventilate a room in which there is a sick person or a sleeper, the air should by some means, as by a board, be directed towards the ceiling of the room. The current of air is by this means disseminated throughout the apartment, and draughts are avoided. If this rule is put in force, it is an excellent plan to have the upper sash of the window lowered a few inches all night long.

When travelling in Africa it is wise to make the very most of the early morning hours. All journeys should be begun not later than 6 A.M., and should be completed for the day not later than noon. Before starting in the morning, and if possible before rising from bed, take a warm cup of coffee and a biscuit. On rising put the feet on a rug of some kind. Wash in cold water, sponging the body freely.

When journeying through malarial districts take 2 grains quinine every morning and evening. Take the drug in tabloid

form or rolled up in cigarette paper. When forced to pitch the camp near to a marsh or pool of stagnant water, if possible be to the windward of it, so as to escape the unpleasant effluvia, and have the openings of the tent looking away from the swamp. All night long keep large log fires burning a few feet from the door of the tent. It would also be a wise precaution to sprinkle a good quantity of sulphate of iron around the temporary dwelling.

There is ample proof that long residence in a warm climate produces changes in the constitution. Of late years, elaborate researches have proved that, under ordinary circumstances of life, residence in the tropics has an adverse effect on the bodily frame of the resident. Health in the tropics has greatly improved from what it was 50 or 100 years ago. The most scrupulous care is now given to the study of the laws of health, with the result that the death-rate has gone steadily down and is still on the decrease. In order to attain even approximately to the temperate standard of health the most extraordinary care is necessary in the tropics. If the want of attention to detail in food, exposure to night air, sleeping apartments, shown in Britain, were imported to the tropics, the mortality would go up with a bound.

Residence in the tropics has an appreciable effect *on the temperature of the individual*. Careful research shows that in India the body temperature of the European living in Bengal is about 0.41° F. higher than the average of healthy persons in England. It has also an effect on the respirations of the individual and on the pulse. It markedly affects the secretion of urine, as even the most casual observer must have noticed. Residence in a warm climate, owing to the heat, the humidity of the air, &c., causes the amount of urine secreted to be much diminished. The actual amount will depend on the moisture lost by the skin and given off by the lungs.

Every resident in the tropics becomes anæmic. This is specially so in women and children. Malaria has a marked deteriorating effect on the number and functions of the red blood corpuscles. All the organs of the body suffer—the blood-forming organs as well as those which carry on the ordinary bodily functions. The nervous system is at first elated, but in the course of months, or a year at the most, it is markedly depressed. Speaking generally the actual weight of the frame is lessened by long-continued residence, the muscular system is lessened in tone, and the vitality of the frame lowered.

CHAPTER II

DISEASES OF THE SKIN

STRUCTURE AND FUNCTIONS OF THE SKIN

THE skin consists of several strata of cells, which lie mostly in layers flattened out, and are united together by a cementing substance. Its main function is *protection* to the delicate structures beneath; but it is also the seat of the sense of touch, and has great absorbing and excreting capacity. It is indeed one vast network of sensory nerves, the meshes of which are so close that the finest point cannot penetrate without causing pain. The tissues below are much less sensitive, so that when once a needle penetrates the skin the pain is comparatively slight. (See Fig. 1.)

Nails and hairs are modifications of the horny layer of the skin. The *sweat glands* secrete a large proportion of the watery and gaseous materials of the body. They are found in almost every part of the skin, in little depressions which abound over the horny layer. The skin covers the entire surface of the body, and changes its character as it enters orifices and canals, such as the mouth and nose and ears, which lead into the inner cavities. In canals such as the mouth and digestive canal it is greatly changed in structure and appearance, and secretes a lubricating substance known as mucus. Here it is named *mucous membrane*. In these canals it is always red and soft and delicate.

DISEASES OF THE SKIN

Erythema.—This is a simple inflammation or redness of the skin, which may be localised or spread over the whole body.

A *chilblain* is a local inflammation accompanied by itchiness and heat and swelling. Any irritant, such as an acid secretion of the body, frequently applied to the skin, will set up an erythema. If a person with delicate skin should violently rub the body with coarse

flannel, a local inflammation will be brought about. If one sits long before a hot fire, or if the arms are exposed to the African sun as in marching, erythema is the result. The redness disappears on being pressed, and the edges of the affected parts are not abrupt, but shade off gradually into the healthy skin. Should the opposed surfaces of tender skin rub each other, as in the hips and armpits, in hot moist weather, a marked form of erythema ensues, and if the irritation is very long-continued, it may become an eczema.

Treatment.—Look carefully for the cause and remove it. Locally apply a soothing application such as flour, oxide of zinc, or starch

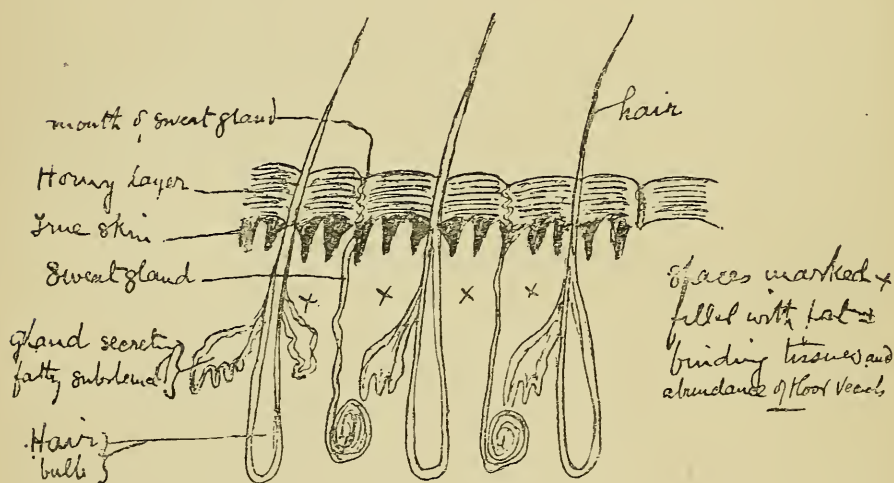


FIG. 1.—DIAGRAMMATIC SKETCH OF THE SKIN.

powder. Benzoic acid (40 grains to two tablespoonfuls of water) is good. Borax (a tablespoonful of the powder to two tumblers of water) is excellent. Itching may be relieved by washing the surface with lotions of the alkalies, or of lead if the affection is local. Should a large surface be involved, take a tepid bath of bicarbonate or carbonate of soda ($\frac{1}{2}$ lb. to 20 gallons is about the proportion).

Prickly heat.—This annoying affection is met with extensively among Europeans in Africa during the hot moist months. Its presence is due to a congestion at the mouths of the sweat glands, and is accompanied by an innumerable number of little red papules, about the size of a pin-head, all over the body. The skin is

unusually rough and dry ; but in a few cases it may be moist, and matter even may form at the mouths of the glands. The redness is accompanied by an intolerable itching sensation, which may prevent sleep. Stimulants, over-eating, the wearing of woollen clothing, all aggravate the affection. After a short period the rash may disappear, with a very slight falling off of the upper layers of the skin, only to appear again in a fresh crop of papules.

Treatment.—Let the sufferer be kept cool. Avoid all stimulants, and let the food be very light. Wear only, for a short time, linen clothing ; but should this be found too cold, wear the ordinary flannel garments over the linen clothing. A texture made of silk and wool is admirable. Take a Seidlitz powder or citrate or acetate of potash. “Eno’s Fruit Salt” is good. Sponge the body, one limb at a time, with strong vinegar, which should be washed off with lukewarm water and thoroughly dried. If there is great irritation, and a tendency to the formation of fluid or matter, let the following be used as a wash :—

Carbolic acid	2 teaspoonfuls,
Glycerine	6 ,,
Rectified spirit	3 tablespoonfuls,
Rose water	3 ,,

Let the night clothing consist of light flannel, silk and wool, or, better still, let it be a gauze singlet with thin pyjamas. *Remedies are of little avail if the patient persists in taking fluids.* Let the folds of the skin be dusted night and morning with the following preparation :—

Powdered boracic acid	} of equal parts.
Starch	
Oxide of zinc	

Apply the following with a sponge after the morning bath :—

Sulphate of copper	10 grains,
Water	2 tablespoonfuls.

The following is also good, and should be gently applied by a wet sponge :—

Sublimed sulphur	80 parts,
Oxide of magnesia	15 ,,
Oxide of zinc	5 ,,

Eczema (native name, *Penza*).—This is a common disease amongst the natives, and is seen both in its acute and chronic

forms. It is not contagious, and begins usually as a violent inflammation of the skin, passing on to blisters with a clear fluid, and even to blebs of matter. There is a burning heat in the affected area and great itching. The fluids secreted unite with dust and hair and dirt, and form scabs, which cover the inflamed parts. It is slow in its course, and liable to come back. The most frequent cause is some local irritation continuously applied. If a person suffers from the veins of the leg being varicose (enlarged), or is subject to indigestion, he is liable to be troubled with this unpleasant affection.

There are many varieties of eczema, but all have the following characteristics :—

1st. A thickening of the skin, due to the long-continued inflammation. It is a common observation amongst coloured races, that if a native gets a cut, and allows it to fester, the skin around becomes infiltrated and thickened. So is it here.

2nd. The surface weeps. A clear fluid trickles down the sore.

3rd. Crusts form.

4th. There is excessive itching. This is most severe when the patient is warm in bed.

Treatment.—Look carefully for the irritant and remove it. If it is due to scratching, see that such is stopped. Almost invariably the disease needs a local as well as constitutional treatment. Avoid rich foods. In treating locally, first remove the crusts by smearing the surface with oil for twenty-four hours, and afterwards applying a poultice for several hours. Let the poultice be large and soft and moist. On removing the poultice, wash with soap, flannel, and hot water. Weak gruel and milk are admirable for this purpose. Should there be no crusts, but only redness and moisture, apply oxide of zinc or borax. In this stage, that is when the affected area is red and moist, soap and flannel should be avoided. When the inflammation is becoming less, use mercurial ointment (5 grains to the ounce of lard). When the skin is dry and scaly and itchy, use oil of cade. Every ointment should be applied on strips of lint, and not rubbed over the affected surface.

Erysipelas (in Scotland, “the Rose”).—It is an acute, spreading inflammation, with swelling and a tendency to suppuration. It may occur in connection with wounds, or burns, or operations, and is frequently seen on the scalp or on the extremities. It is slightly infectious, and is sometimes epidemic, so that we may say some specific poison, introduced from without, lays hold of the body tissues and weakens them. The glands near the affected part are inflamed, and the patient is feverish.

The simple form of erysipelas is seen on the face, at the angles

of the mouth, nose, eyes, or ears, or indeed wherever the skin and mucous membrane meet. At first the part is rosy red, but in a short time it becomes dusky. The skin is stretched, and consequently appears smooth and shiny. The edges are abrupt, so that they can be felt; but there is a constant tendency to spread in some special direction. The glands in the neighbourhood of the affected part are tender and inflamed. The disease usually runs its course in from ten days to three weeks.

The more serious form may have little vesicles or blebs containing fluid or even pus, on its surface. This form is seen near to a wound and mostly in the extremities. It may set in with shivering and fever.

Treatment.—As the disease is very contagious to those who are suffering from open wounds, the patient should be removed at once, and the most careful attention given to cleanliness and ventilation. Let the sufferer rest in bed and take good, plain, nourishing food. Five grains of calomel, followed in two hours by a Seidlitz powder, is good. Take 20 to 40 drops of the tincture of the perchloride of iron every two hours, and 3 grains of quinine every four hours. Let the local affection be covered with flour, or starch, or oxide of zinc powder, and protected with a thick layer of cotton wool. Powdered camphor is very soothing. If the extremities are affected, let them be elevated in addition to the above treatment. Wash the parts daily with warm water and renew the dressings. All cast-off dressings should be immediately burned. If the head is affected, let it be shaved and cold water or ice applied.

Urticaria or “Nettle-rash” (native name, *Amawunia*).—This disease is common amongst the natives of Africa. It has the appearance of the sting of a nettle, and hence its name. It is a little white circular elevation on a red ground, never larger than the finger-nail. It has an intense burning or stinging sensation. The one thing which characterises this disease from other itching skin diseases is its evanescence. The stinging sensation may be almost intolerable, and in an hour the unpleasantness may have passed away. Its reappearance is equally sudden and mysterious. It has been suggested as a means of diagnosis, that, if we write on the skin with a pencil, or with the nail of the finger, the lines are followed by a nettle-rash tracing. The causes of the affection are some irritation affecting the nerve supply, some mental emotion, the eating of bad food or shell-fish. The natives say that if some individuals eat certain grains, they are sure to suffer from this disease. They liken the sensation in the affection to the sting of hornets.

Treatment.—Find out and remove the cause. At the beginning

of the treatment give a brisk purge, or an emetic of sulphate of zinc. There are various ways in which the itchiness may be relieved. It may be effected by sponging the surface with equal parts of tincture of benzoin and water, or with vinegar and water. Eau de Cologne is also good. The following is excellent :—

Carbolic acid	.	.	.	2	teaspoonfuls,
Glycerine	.	.	.	6	„
Water	.	.	.	6	tablespoonfuls.

Boils.—These are very common amongst Africans. They are never seen on the palms of the hand or soles of the feet, but are common on the back of the neck, armpits, hips, &c. They often come in crops. They begin in the tissues under the true skin, and generally start in one or other of the glands lodged there. At first there is local itchiness, to give relief to which the part is scratched. This results in a small papule, with a hair coming from the centre. In two days there is an extensive red surface with pus in the centre. This pus dries up, but the scratching being still indulged in, the centre is pulled out, and results in a small hole with a hard firm base. More pus is formed and discharged. A **sty** is such a boil on the edge of the eyelid. The characteristics of a boil are two in number: it has a central slough, and is not larger than a walnut.

Treatment.—Remove the local irritation, such as the friction of the clothing. Sometimes a boil may be aborted by pulling out the central hair, and injecting, by a needle, a drop of pure carbolic acid. Another method is to moisten with tincture of iodine. Nitrate of silver (1 drachm to 2 tablespoonfuls of water) is also good. In order, however, to be effectual this must be done at the very commencement of the affection. Should it have been neglected at the very beginning, apply hot fomentations or a warm moist poultice. Too frequent poulticing is apt to bring on a fresh crop of boils in the neighbouring parts. In order to avoid this, protect the adjacent skin by oil and glycerine. Tincture of opium, sprinkled over the poultice, will relieve the pain. When the boil is fully ripe, and only then, remove the top and the pus, together with the indurated centre. After that let the sufferer take rest and light nutritious food. Free purging is good.

Carbuncle.—In some respects this is an exaggerated boil. It is really a slough of the tissues below the skin, which causes the skin to be red and dusky in appearance. The pain of a carbuncle is always great, and at times is intense. In a boil the top is pointed, in this it is flat. Often it is two inches in diameter or even

more. In course of time the dark skin over the inflamed area is pierced by a number of small holes and bursts, then the slough escapes—it may be in one whole piece. A raw cavity is now visible with much undermining of the skin. A carbuncle is usually single, a boil multiple. It is most frequently seen on the back of the body, while a boil may appear on any part of the body.

Treatment.—Attend to the digestive organs, and let the food be nourishing. The sufferer should have plenty of fresh air. If he is strong and healthy, and the carbuncle ripening, make a free cross cut right into the mass, and wash it with carbolic acid 1 part, to water 60 parts. After this the carbuncle will disappear. The general health of the sufferer must now be attended to by change of air and light nourishing food.

DISEASES OF THE SKIN DUE TO ANIMAL PARASITES

The following diseases are contagious but not infectious ; that is to say there must be actual contact before they can be transmitted. They usually appear when the system is weakened and run down. They are all accompanied by itching, which leads to scratching and abrading of the skin, and the appearance of drops of fluid, or even blood. Most natives suffer from their ravages, and personal servants are apt to give them to Europeans.

Lice.—The louse is a wingless insect found on man, which feeds by suction. It produces an eruption of slightly raised papules which has a characteristic itching. There are three varieties—

- (a.) *On the body.*—This insect pushes its proboscis into a hair follicle until it reaches the capillary blood-vessels. The bites are seen chiefly on the neck and wrist. The eggs are not found on the body of the host, but in the folds of the clothing.
- (b.) *On the head.*—This insect is smaller than the above. The eggs are attached to the hair and not to the scalp. It has long legs, and is able to run among the hairs.
- (c.) *On the pubis.*—It is found on all hairy parts of the body except the head.

Treatment.—Look carefully for the insects and the eggs. Carbolic acid is the best remedy. The following is a good preparation :—

Carbolic acid.	.	.	.	2	teaspoonfuls,
Water	.	.	.	12	tablespoonfuls.

With this sponge over the affected parts morning and evening.

In the case of the head it is often necessary to remove the hair and to wash with carbolic acid 1 part to 60 parts of water. Afterwards wash the part freely with soap and water. Let all clothing be thoroughly boiled.

The common house-bug (*Acanthia lectularia*).—This insect is very common in Africa, especially in old houses. Its red flat body, offensive odour, nocturnal habits, and biting propensities are well known. It is very tenacious of life, being able to exist for a year or more, without nourishment of any kind. Its bite is like a nettle sting, but the actual bite in the centre of the circle is quite visible, and does not disappear on pressure like the redness around. It is said to be killed by "Persian Insect Powder." This powder should be sprinkled on the clothing, and inserted into the crevices of the woodwork of the house with care. In order to relieve the itching, rub the bites with Eau de Cologne, or very strong vinegar, or ammonia. The following lotion is good :—

Dilute hydrocyanic acid	.	.	.	.	2	teaspoonfuls,
Glycerine	.	.	.	.	3	"
Water	.	.	.	.	12	tablespoonfuls.

The common flea.—This insect is found all over Africa, and everybody suffers from its ravages. It has remarkable powers of leaping, being able to jump two hundred times the length of its own body. This it does by means of the very remarkable muscles of its legs. The eggs are deposited in dust and sand, and even under the toe and finger-nails of the Africans. The bite is more painful than itchy, and causes a hæmorrhage into the tissues, owing to the injury offered to the blood-vessels. The bites are always surrounded by inflammation and swelling, and are found where the clothing embraces the body. To destroy them use the following :—

Carbolic acid	.	.	.	.	2	teaspoonfuls,
Water	.	.	.	.	12	tablespoonfuls,

or the following :—

Perchloride of mercury	.	.	.	.	12	grains,
Rectified spirits	.	.	.	.	2	tablespoonfuls,
Water	.	.	.	.	10	"

Sponge the parts night and morning.

Chigger or Sand flea (native name, *Matekenya*).—This remarkable insect was at one time confined to America, but within the

last few years it has crossed the continent of Africa, and is now rapidly penetrating the Soudan and South Africa. In a short time we shall hear of its ravages in tropical Asia.

It lives in sand or on the ground, in the grass. It is most common where cows and domestic animals abide. It is smaller than the common flea, but, like it, is reddish brown in colour. It is a true parasite, sucking the blood by piercing the skin. The male insect gives us no further trouble, but the female, when impregnated, buries herself in the skin of any warm-blooded animal—and the warmer blooded the kindlier for her. In the case of man, she selects the feet or fingers, and preferably the horny parts of the skin. She goes slantingly under the skin, towards the soft tissues, and there settles and imbibes the blood. Here safely lodged, the abdomen begins to enlarge by the development of the eggs. The skin over the insect rises, until a small tumour is observed about the size of a pea. From the moment she pierces the skin until the end, the part is extremely itchy. If carefully looked at, the small hole of entrance will be seen as a dark spot, with the abdominal appendages occupying the same. The tissues around become inflamed and may suppurate. In time the covering of skin over the insect dies, and the intruder, now having assumed an enormous size (comparatively), is ejected. The eggs are fully ripe when this takes place, and the overstrained abdomen bursts, and scatters thousands of eggs on the ground. Soon each egg becomes a larva, and weaves for itself a cocoon, and passes through the nymphal stage. In a week they emerge as full insects.

Treatment.—Extract the insect from the horny skin before it reaches maturity, and burn it. If it is allowed to rupture the overlying skin, the parts will certainly ulcerate. The insect extracted, bathe the toes with the following :—

Carbolic acid,	.	.	.	.	.	1 part,
Iodoform	.	.	.	.	.	2 „
Glycerine	.	.	.	.	.	3 „

Let the house be daily thoroughly swept, and the floors sprinkled with carbolic acid (1 to 60 of water).

Solutions of ammonia, hazeline, or eucalyptia will relieve the itchiness.

Ifwingire.—This is the native name for a disease which is common amongst native Africans, and which also is sometimes seen amongst Europeans. It consists of the presence of maggots in the tissues of the body. These maggots are often seen in the bodies of

dogs, cats, antelopes, and most animals that frequent the long grass. The eggs of the insects are lodged in meat, milk, blood, or other substances of a fluid nature. They are commonly found on the floors of houses and leaves of bananas. In due time the eggs are hatched, producing a larva, which is white, the size of a small flea, and able to creep about actively. Seeking for a home in the flesh of some warm-blooded animal, they often pierce the flesh of human beings. The natives call them "ifwingire," from "ingira," to enter. In the tissues they continue growing for weeks, but as they are more or less quiescent, they occasion little inconvenience beyond a slight uneasiness. As they reach their maturer stage they are about $\frac{5}{8}$ in. in length and $\frac{1}{8}$ in. in breadth, and begin to wriggle about. The stinging sensation produced calls the attention of the host. There is found a large papule or small boil, with the head of the insect in the centre. If the head is touched it is immediately withdrawn. Should the maggot not be extracted by pressure, it sets up a most irritable-looking ulcer, from which a clear or bloody acrid ichor flows. The discharge from the sore is extremely virulent; for, should it touch even healthy skin, it is apt to bring about a spreading ulcer. In the European these maggots are usually single, but I have seen the whole side of the body of neglected African children one mass of ulcer from this cause. African dogs too have them frequently in great numbers. Many animals die from their effects.

Treatment.—On carefully inspecting the angry-looking papule, and the head seen to be protruding, extract the maggot by pressure with the nails of both thumbs. Wash the ulcer with some degree of care, and dress it with the following :—

Carbolic acid	1 teaspoonful,
Olive oil	10 „

The itch (native name, *Peré*).—This is the most common of all African skin diseases. Almost every native suffers in his wrists or hips or thighs. It is highly contagious, and is usually got from dogs and cats. The disease is due to the presence on the body of the itch insect—*Acarus Scabiei*—and the itchiness is wholly due to the female insect. After the female has been impregnated, she burrows along the layers of the upper skin, often for a considerable distance, and as she crawls she lays her eggs. If this canal be magnified, something like this will be seen. (*See Fig. 2.*)

The female insect is at the end of the canal, and the eggs are in rows behind. The insect having got into this canal, cannot, owing to her many spines, retreat, but must go forward. She usually

enters the skin by the side of one of the hairs, and as she crawls she irritates the superficial nerves of the skin most violently. She prefers delicate skin in warm parts of the body. As the sufferer scratches to gain relief, he may set up blisters and sores. The natives very often set up an eczema from this cause, so that the two diseases are frequently found on the one person.

Treatment.—This resolves itself into the removal of the insect and her eggs. To do this the body must be well soaked, and washed with soap, warm water, and flannel. Let the sufferer lie in warm water for an hour, so as to thoroughly soften the skin. The body

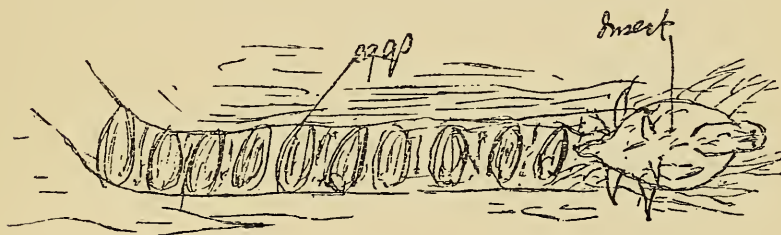


FIG. 2.—FEMALE ITCH INSECT BURROWING IN THE SKIN,
AND LAYING HER EGGS.

then being thoroughly dried, rub vigorously with some preparation of sulphur. The following is best :—

Carbonate of potash . . .	1 teaspoonful,
Flowers of sulphur . . .	2 „
Lard or oil	24 tablepoonfuls.

Let the above treatment be continued for three days in succession. European clothing should be thoroughly boiled and washed, and the rags of the natives should be burned.

Mosquitoes.—There are many varieties of mosquitoes known to entomologists, and Africa has a goodly proportion. Some people are much less susceptible and sensitive to their bites than others, but all Europeans suffer. In some parts of Africa an additional terror is added to the bite, since some varieties of mosquitoes are the host of the embryonic stage of three varieties of the *Filaria Sanguinis Hominis*, a parasite belonging to man, and associated with the disease of elephantiasis. Some authorities say they also are the agent for the introduction of another parasite—*Bitharzia Hæmatobia*—which gives rise to serious trouble in the liver. Again,

it may yet be shown that they are the direct cause of the great scourge of tropical countries, namely, "malarial fever." It is only the female mosquito that bites, the male being a puny insignificant thing. They are only active at night or during very dull weather.

Treatment.—No European should travel without a mosquito-net, and at no time should he ever sleep without the same. Some recommend the smearing of the face and exposed parts with carbolic oil, others prefer to wash with a soap made from lanoline and eucalyptia. Burning camphor in the sitting-room keeps them away. Where it is possible, however, a large log fire should be kept burning at the door of the house. To relieve the irritation of the bite, apply strong ammonia, or strong vinegar, or hazeline, or eucalyptia.

In some countries the natives smear themselves with oil or grease, and even sleep with their bodies buried in sand. Others sleep in thickly woven mats, which they carefully tuck under on retiring for the night. During the height of the wet season in other places the natives sit up most of the night, and sleep by day, in order to escape this enemy.

Ticks.—These troublesome insects infest dogs, sheep, and cows, and frequently lay hold of human beings. They are found on grass, and are abundant for a month or two before the rains. They have flat bodies, and are suckers. They creep up the clothing and attach themselves to any delicate part of the body.

Treatment.—Use carbolic soap freely in the daily bath, and during the season anoint the lower limbs with carbolic acid 1 part to 10 of olive oil.

Leeches.—These are found in the water of marshy districts. When wading in such places the leeches may attach themselves to the legs, and extract a considerable quantity of blood.

Treatment.—Dislodge them by the use of salt and water, and in order to stop the bleeding, apply pressure, or touch the bleeding point with a little nitrate of silver.

DISEASES OF THE SKIN DUE TO VEGETABLE PARASITES

Most of the diseases due to vegetable life found in Europe abound in Africa. The heat, moisture, habits of the people, together with constitutional peculiarities all tend to this development.

Ring-worm.—This disease appears on the body as rings, or parts of rings, enclosing areas which are lighter in colour than the healthy

skin. The edge of the patch is reddish, scurfy, itchy, and often appears in the arm-pits, on the breast, abdomen, or back. In hot damp weather the itchiness is so excessive that the sufferer cannot sleep, so lies all night long, indulging in the "delight" of a good scratch. Often by so doing he makes the part weep or even bleed. When cold dry weather sets in, the itchiness is less severe, and tends to disappear, so that only a reddish scurfy spot may remain. The disease is due to a low form of fungus attacking the hairs of the skin.

Treatment.—The best remedy for natives is chrysophanic acid in some form or other. The following is excellent :—

Chrysophanic acid	20 grains,
Vaseline	2 tablespoonfuls.

Let this be well rubbed in, twice every day, and it will be cured in about a week. This acid stains linen clothing.

Another good remedy for the thick-skinned native is the free use of the strongest liniment of iodine, one or two applications of which is sufficient. Some advise the painting of the patches with strong acetic or sulphurous acid. Some forms of ring-worm are very unamenable to treatment, especially if the disease is extensive and long-standing. In such a case use the following :—

Perchloride of mercury	2 grains,
Water	2 tablespoonfuls.

This is applied by painting the part with a small brush every day until a change is apparent.

If the ring-worm is on the beard, the hairs must be pulled out, in order that the antiparasitic medicine may do its work. After this has been done, apply the above perchloride of mercury solution, or the following :—

Hyposulphite of soda	1 teaspoonful,
Water	2 tablespoonfuls.

DISEASES OF THE SKIN DUE TO ABNORMALITY IN THE SWEAT GLANDS

Excess of perspiration is the normal state in Africa. It is seen to be greatly in excess in rheumatic fever, malarial fever, &c. It is brought on by the inordinate use of food and spirits. Perspiration is abundant in the hot season, and leads to a number of

troubles. It follows upon excitement and faintness. Then some persons have a constitutional tendency to excess of perspiration, being troubled on the slightest departure from the normal state of life.

Great sweating is seen in the palms of the hands, soles of the feet, armpits, groins, and genitals. Some suffer greatly from sweaty feet, and especially from a most disagreeable odour, which accompanies the same. The excessive perspiration tends to inflame the soles and to make walking difficult. Some say a certain bacterium finds a nidus in this perspiration and sets up the odour.

Treatment for excessive perspiration of the body.—Tonics are here indicated, such as quinine, strychnia, and arsenic. Easton's syrup, 1 teaspoonful half-an-hour before each meal, is best. Dover's powder 10 grains every day, or nitrate of pilocarpine $\frac{1}{20}$ of a grain three times a day, will stop it. But the most powerful remedy is atropia injected under the skin. This, however, should only be given by a medical man. It is the following :—

Sulphate of atropia .	1 grain,
Water	500 drops—of this inject 5 drops.

Treatment for sweaty feet.—Change the socks twice every day, and when they are taken off let them be soaked in the following solution : Eight tumblers of hot water, having dissolved in it as much boracic acid as the water will contain. After soaking the socks, hang them up to dry, using them again, with a certain amount of the antiseptic boracic acid retained. Cork soles are recommended. If the shoes smell badly, dust them inside with boracic acid. Wash the feet every night with cold water, and rub the soles with zinc ointment.

CHAPTER III

DISEASES OF THE DIGESTIVE SYSTEM

STRUCTURE AND FUNCTIONS OF THE ORGANS OF DIGESTION

SPEAKING strictly, food as we know it does not go into the body—it passes through it. During its passage chemical changes are wrought on the food substances: a certain proportion is absorbed into the body proper, while the effete substances are thrown out. The canal through which the food passes is known as the “alimentary canal.” It is a musculo-membranous tube about thirty feet in length, and is lined throughout with a delicate membrane which secretes mucus. This canal begins at the mouth and ends at the anus. In its course it has various names. *First*, there is the mouth, where the food is masticated and mixed with saliva; *then* there is the pharynx and gullet, where the act of swallowing takes place; *next* is the stomach, where chemical changes are wrought on the food, known as “digestion” proper. The food then passes into the small intestine, where the nutritive substances in it are acted on by the bile coming from the liver, and the pancreatic fluid coming from the pancreas, and are taken into the system as chyle. The next part of the canal is the large intestine, which contains effete substances in large proportion.

By carefully studying the accompanying sketches, it will not be difficult to follow the course of the food through the mouth, past the entrance to the windpipe, and into the gullet and stomach. (Figs. 3 and 4.)

During a meal, the various substances of food are torn and ground by the teeth. The tongue rolls the mass from side to side, while the glands, surrounding the mouth, pour the saliva over the food, which becomes thoroughly intermingled with it. Most of the starch of the food substances is converted into sugar right away while it is still in the mouth. The bolus is then swallowed and

passed into the stomach. In this organ the gastric juice, which is freely poured out, acts upon the proteids (meat, albumen of egg, cheese, &c.), and changes them into peptones which are very soluble. The stomach contents are now passed into the first part of the bowel—the duodenum—where they are acted on by the secretions of the liver (bile), and the secretions of the pancreas. All fats are converted

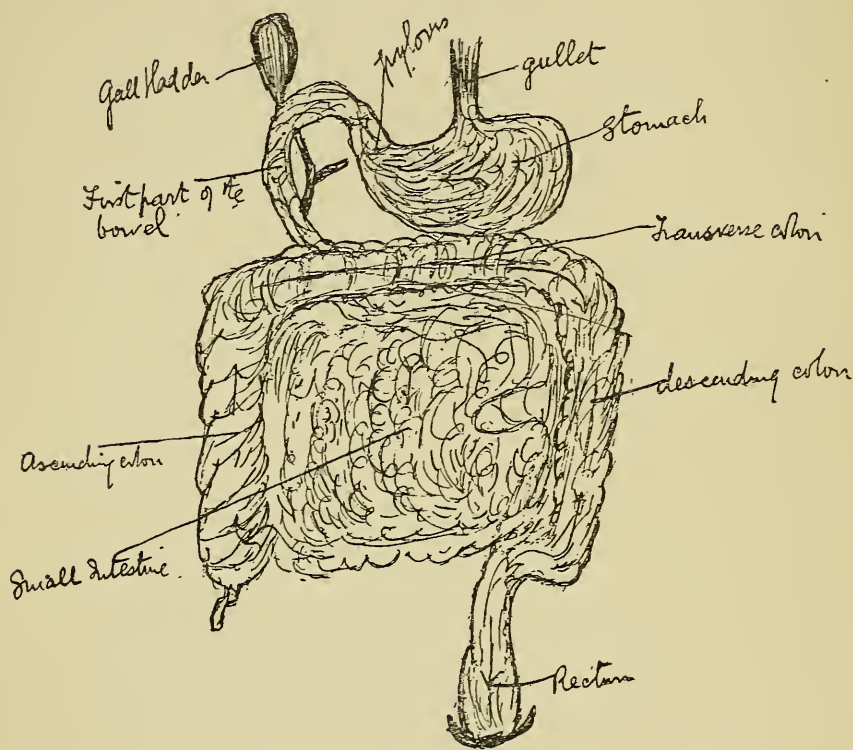


FIG. 3.—DIAGRAMMATIC SECTION OF THE GULLET, STOMACH, SMALL AND LARGE INTESTINES.

into emulsions (like milk), that is to say, the fats are broken up into minute particles, and each is covered with a coating of albumen, so that they cannot run together. The pancreatic juice seeks out the remaining starchy substances which have not been acted on by the saliva of the mouth, and changes them so that they can be absorbed. The food is now a milky fluid of the consistency of cream, and is known as chyle. It is forced on by the movements of the bowel, and is brought into contact with the mucous membrane

of the bowel. The very soluble substances are at once taken up by the blood-vessels, and pass into the liver and the venous system ; while the other particles pass into the lacteals, which unite as the lymphatics, and so also reach the veins.

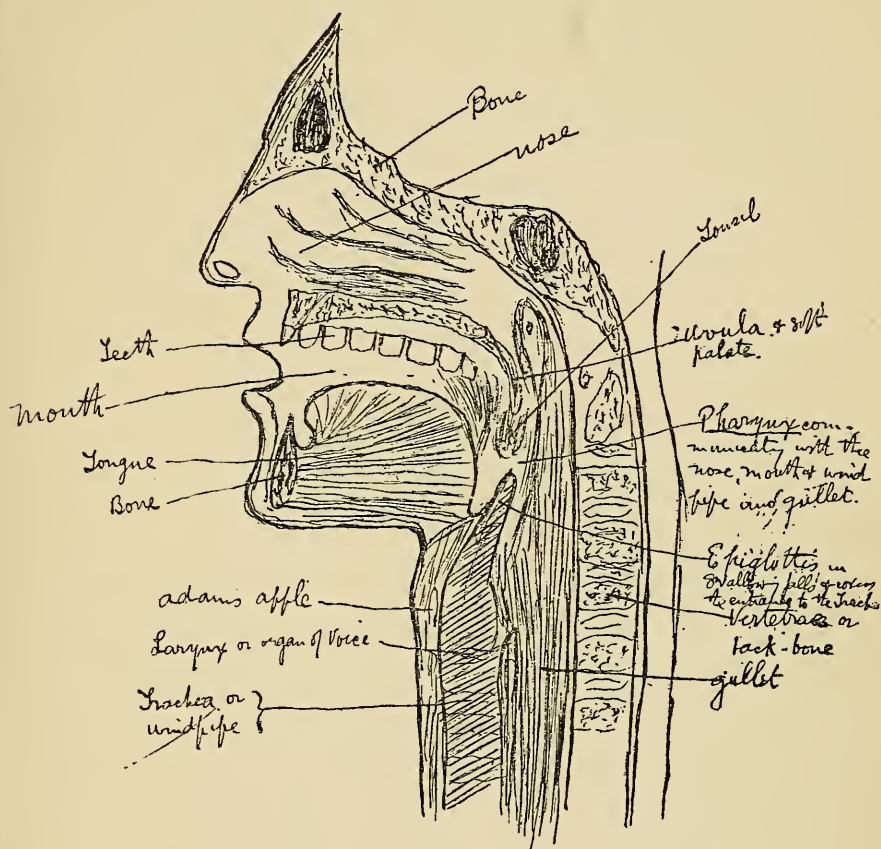


FIG. 4.—VERTICAL SECTION OF THE FACE AND NECK, SHOWING THE NOSE, MOUTH, GULLET, AND WINDPIPE.

DISEASES OF THE ORGANS OF DIGESTION

Inflammation of the mouth.—This is common among young people. It depends, in some cases, on microscopic fungus plants living in the tissues of the gums and cheeks. The tongue and mouth are covered with flaky white patches, which are somewhat round and elevated, while the rest of the membrane is hot and swollen. Saliva dribbles from the lips.

Treatment.—In simple cases avoid acids and sweets of all kinds. Milk with a little lime-water, or milk with a little bicarbonate of soda is good treatment. When there are sores in the mouth use the following :—

Chlorate of potash	1 teaspoonful,
Warm water	1 tumbler,
Glycerine	1 teaspoonful.

This is an excellent gargle for the mouth and throat. Borax and honey mixture is good for applying locally. In the parasitic form use this :—

Carbolic acid	12 grains,
Glycerine	2 teaspoonfuls,
Water	8 tablespoonfuls.

With a piece of lint apply very freely to the tender spots, three times a day.

Ptyalism, salivation, or an abnormal flow of saliva in the mouth.

—This is usually a symptom of some other affection, and consequently its treatment will depend on a careful diagnosis of its cause. In children it is often due to delayed dentition or to inflammation of the mouth.

When mercury, in any of its forms, is pushed too far, it brings on a salivation of the mouth. In such a case the drug should be stopped, as to push the medicine further will do no good, and might do much harm. Locally, wash the mouth with a weak solution of permanganate of potash, and apply chlorate of potash 1 part to 40 parts of water. If, however, the mercury has been pushed so far that the gums are swollen and ulcerated, some astringent will be necessary. Alum (1 to 40 of water), or chloride of zinc (2 grains to 2 tablespoonfuls of water), or tannic acid (1 to 40 of water) are good. Should there be an unpleasant fœtor present, wash the mouth with carbolic lotion (1 to 80 of water) or weak permanganate of potash. If the system is down, stimulants may be used, and only liquid foods partaken of. Never give atropine in a case of mercurialism such as the above, for here nature is burdened with the poison and is throwing it off.

Sore throat.—This may occur by itself, or in conjunction with fever and syphilis. It is also seen in those who are afflicted with acute rheumatism. Exposure of any kind will bring it on. The mucous membrane on the tonsils, soft palate, and back of the throat is red and swollen. There may be fever up to 102° F. The throat is painful, and swallowing is difficult. At first there is a

dry sensation, but in a short time secretion becomes abundant. The sufferer may speak through his nose.

Quinsy is an exaggerated form of the above, and is often seen in young people. The tongue is furred and the bowels are bound. The urine contains albumen.

Treatment.—Let the sufferer rest in bed in a warm room, and apply hot fomentations to the throat. Let him also inhale steam, say from a teapot. Owing to the difficulty in swallowing, avoid all solid foods, but keep up the strength by small quantities of nourishing soups, given every two hours. Open the bowels freely with the following powder :—

Calomel	5 grains,
Jalap	15 „

Some authorities recommend the following to be taken every hour :—

Tincture of aconite	1 drop,
„ belladonna	1 „

If no sleep is to be had at night, give 10 grains of Dover's powder ; and should this be vomited, repeat it, and in a short time it will be retained. When the severe symptoms have subsided, give tonic medicines, and order a change of air. Easton's syrup is on the whole the best tonic. Take one teaspoonful before each meal.

The teeth.—Before leaving for Africa it is absolutely necessary that the teeth should be attended to by a competent dentist. Let all stumps be removed, and all imperfect teeth stopped. The teeth suffer much from a variety of causes in malarial countries.

A tooth consists of the parts as shown in diagram.

Toothache may come—

1st. FROM CARIES, where there is softening and decay of the dentine or ivory part of the tooth,

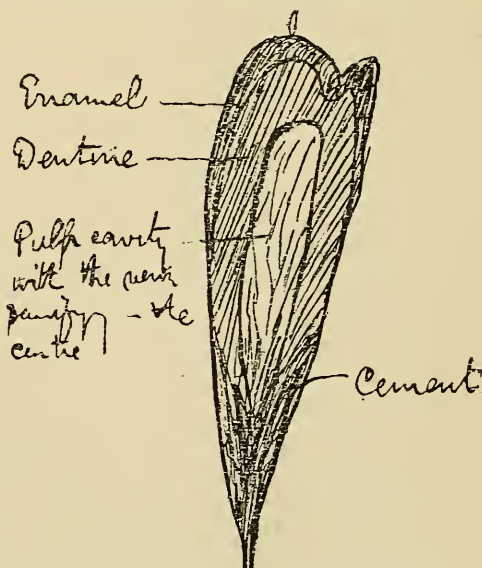


FIG. 5.—DIAGRAMMATIC SECTION OF A TOOTH.

so that the cavity, where the nerves are distributed, is exposed and inflamed. The dentist can treat this in a number of ways.

2ND. FROM INFLAMMATION OF THE PULP CAVITY.—Here food or cold has inflamed the delicate centre of the tooth. An active purge of 5 grains of calomel and 15 grains of jalap will act well in such a case. Wash the mouth with bicarbonate of soda in hot water, dry out the cavity of the tooth, and apply a small portion of the following mixture upon cotton wool :—

Menthol	2 parts,
Butyl chloral hydrate	1 „
Carbolic acid	1 „
Cocaine hydrochlor.	1 „
Creosote	1 „

This is a colourless oily fluid. It is also excellent in preparing teeth for being stopped. It should be remembered, however, that this application is of little use where pain is caused by some inflammatory action at the roots or in the tissues around.

3RD. FROM AFFECTION OF THE ROOTS OF THE TOOTH.—Here the head of the tooth may be healthy, but the roots diseased. Abscesses in such a case give great annoyance. Get the tooth extracted.

4TH. FROM NEURALGIA.—There is here some affection of the nerves which supply the tooth. Give 5-grain doses of quinine twice within twenty-four hours, and it may ward off the attack, when expected. Fifteen grains of antipyrin will do the same. Refer to the article on neuralgia.

In order to extract a tooth without pain, use the following :—

Cocaine hydrochlor.	2 grains,
Water (pure)	10 drops.

By means of a hypodermic syringe, inject at the side of the tooth not more than eight drops, and wait for five minutes. The tooth should then be extracted painlessly. The anæsthesia will last for ten minutes more. This should be done by a medical man.

DISEASES OF THE STOMACH

The following are the signs of the stomach being out of order :—

1ST. PAIN over the region of the organ. This may simply be an uneasiness, like a lump behind the breast-bone, or it may be actual pain. It radiates from the stomach to the shoulder-blades or the spinal column. It may be caused by gases in the organ, or

indigested food, or excess of acids. If the pain is due to disease of the stomach itself, it will come on *immediately after* a meal, and there will be no relief till the food is parted with; pressure also applied to the stomach will increase the pain. If the uneasiness is due to indifferent digestion, these two things are reversed—it comes on *some time after* food is taken, and pressure brings relief.

2ND. HEARTBURN.—This is a burning sensation with the regurgitation into the mouth of acid fluids. There is sometimes, also, what is popularly called water-brash—namely, the regurgitation into the mouth of a clear alkaline fluid.

3RD. FULNESS OF THE STOMACH.—The organ is blown out by gases which have been formed by the fermentation of the foods.

4TH. NAUSEA AND VOMITING.—The vomited substances may be bile or blood. Here we have nature trying to get rid of some injurious substances.

5TH. THE TONGUE IS COATED with a yellow fur.

6TH. HEADACHE.

Indigestion or Dyspepsia.—Here we have only abnormal digestion, and no actual disease of the stomach. The secretions and movements of the organ are unnatural. As a consequence the food is passed on undigested to the bowel. Constipation, &c., is the result. Alcohol, chills, and overwork are at the root of most of these ailments. They are frequent in Africa, being brought on by poor food, imperfectly cooked, and less perfectly masticated. In indigestion most of the above signs of stomach affection are found.

Treatment.—Look to the diet. Avoid all foods that are difficult to digest, as salt meat, cheese, veal, pork, and tinned meats. Avoid rich dishes of every kind. For a few days take milk only, mixed with barley-water. Cocoa is here to be preferred to tea or coffee, and should be well diluted with milk.

By way of parenthesis, I would most highly recommend the “poor man’s cow,” the African goat. She thrives in every part of Africa, even the poorest, and can go with the traveller on every journey; even the steamers and river boats can carry one or two milch goats. A fairly good supply of fresh milk will thus be available. No one should travel for any long distance without a couple of goats.

Take gentle exercise in the open air, and partake of very little food at a time. Take a tepid bath every morning, but on no account attempt a cold bath. Wear only fine flannel or silk and wool clothing. Natives suffer much from this form of dyspepsia, and can we wonder when we see the food they eat, and know their manner of cooking? For the relief of the pain take a prompt emetic, such as a large spoonful of mustard in half a cup of water,

or drink salt and water. Thereafter take small draughts of hot water. For the acidity nothing is better than three tabloids of soda-mint as supplied by Messrs. Burroughs, Wellcome & Co.

Biliousness.—This is a form of indigestion which is common. In such a case the tongue is furred, there is severe headache, giddiness, and, it may be, a little jaundice. It is purely a case of hepatic dyspepsia. The liver may be enlarged and congested, much the same as when this disease is one of the symptoms of severe malarial fever (which see).

Treatment.—If the case is mild, give 5 grains calomel and 15 grains jalap. When the stomach is irritable, calomel is most useful. Or use the following :—

Mercurial pill	1 grain,
Compound rhubarb pill	4 „

Take one of these pills every night. Nitro-hydrochloric acid is most useful also. The best way to take it is the following :—

Dilute nitro-hydrochloric acid	2 teaspoonfuls,
Infusion of quassia	16 tablespoonfuls.

Of this take a tablespoonful three times a day in water before food. Drink plenty of soda or potash water. A gasogene is excellent for Africa. Apply mustard poultices or turpentine stupes over the region of the liver.

Vomiting.—This is not a disease but a symptom, and is often a violent effort of nature to rid the system of something injurious. The mechanism of vomiting is caused by the pyloric or lower end of the stomach closing, and a violent contraction of the walls setting in. (*See Fig. 3.*) It occurs most readily when the stomach is full, and in order to this, before a dog vomits, it distends the stomach by swallowing air. Should vomiting be very violent, the abdominal muscles also contract, with suddenness, and assist the stomach. Before the act there is nausea, and a great secretion of saliva. The substance ejected often consists of partially digested food, which is sour, the acidity being due to the presence of gastric juice. If the vomiting be continued for any length of time, it will be mixed with bile of a yellow or green colour. Blood may be vomited, and may indicate the presence of an ulcer in the stomach, or congestion of the organ from disease of the liver. The blood may be bright red, brown like coffee, or almost black; the darkness being due to the action of the digestive fluids.

Treatment.—Sometimes it is necessary to get rid of a nauseous

substance as poison, indigestible food, or bile which has passed back into the stomach. Vomiting may be brought on by tickling the back of the throat with the finger or a feather, by putting three teaspoonfuls of mustard in a cup of water and drinking quickly, or by swallowing 30 grains of sulphate of zinc in water. The following is most effective, need not reach the stomach, and is resorted to in cases of poisoning which demand most prompt action, or where the stomach is sensitive. Inject $\frac{1}{10}$ grain of apomorphine hypodermically, and in three seconds vomiting will be brought about.

To stop vomiting.—Put a mustard poultice over the stomach, give ice to suck if this is to be had, and liquor arsenicalis 1 drop before anything is partaken of. Give morphia hypodermically, $\frac{1}{8}$ to $\frac{1}{2}$ grain, in more serious cases.

Sea-sickness.—Certain individuals are martyrs to this truly harassing malady, while others are not affected. This peculiarity is due to the nervous system, and runs in families. It is a mistake, as was advised long ago, to take a hearty meal before setting out on a voyage, as it is a mistake to fast for some hours before embarking. Take a light meal some three hours before experiencing the motion of the sea. Some recommend a warm-water enema. Have the cabin made “ship-shape” before the journey is undertaken, and on no account remain below—the rocking motion in such a case would make even the least susceptible excessively sick. Find a comfortable spot amid-ships, where the motion is least; wrap the body well up in rugs; if possible put a warm-water bottle to the feet, and a mustard leaf over the region of the stomach. Face the breeze cheerfully, and fight the weakness. The following additions are good: sucking small pieces of ice; sipping a teaspoonful of dilute hydrocyanic acid in the following proportions—hydrocyanic acid 35 drops, water 4 tablespoonfuls.

The drugs recommended for sea-sickness are numberless. The best is perhaps the following, to be taken thus: for a day or two, before embarking, take 20-grain doses of bromide of ammonium three times in the twenty-four hours; then as soon as the expectant sufferer is on board, he should apply a broad tight bandage to the abdomen and lie in a recumbent position.

When the vomiting has once been established, relief should be sought in sucking ice, or in sipping champagne in which ice is plentiful. Mustard may also be applied to the region of the stomach.

After two or more days, should the vomiting continue, the sufferer must take food in order to keep up the strength. Cold soups should be tried first.

Catarrh of the stomach—gastritis.—This affection is very common. It is usually due to indigestible food, alcoholic excesses, tinned meats, and above all, to tinned fish. There is severe pain over the region of the stomach, which is increased by food and relieved by vomiting. There is a constant desire to vomit, and often only a glairy mucus, stained with bile, is parted with. The tongue is furred. The affection usually begins with a chill, which leads to fever, headache, and sleeplessness. The inner coat of the stomach is congested and swollen, and it may be ulcerated.

Treatment.—If tinned meat is suspected, give an emetic of mustard or 30 grains of sulphate of zinc, and follow up with a brisk purgative. Take no food for twenty-four hours, and then allow small quantities of liquid soups or milk. No solid food should be taken for several days. If the vomiting persists, apply poultices or hot fomentations over the stomach, and give morphia as indicated in the article on vomiting. Effervescing drinks relieve the pain. Leeches over the stomach would be good. The one thing to know is that the inner lining of the stomach is inflamed, and that all treatment should tend to draw blood from that membrane.

Diarrhœa.—This is not strictly a disease, but a symptom. It is analogous to vomiting. The bowel is relaxed, and there is a frequent evacuation of loose liquid stools. In addition there is increased peristaltic (wormlike) motion of the bowels. The inner coating is inflamed by some substance, or the circulation through the liver, being impeded, has caused congestion of the bowel. The character of the stools varies greatly. They may contain true faecal matter, or bilious substances of a yellow or green nature. Slimy and bloody substances may also be present. It may even be that the food is passed having undergone little alteration.

The acute form generally begins suddenly, and is due to a chill setting up a congestion. Bad food or water may also bring it on. With each stool there may be a straining and griping with rumbling within the bowel. The ejected matters may be acid, and so cause the anus to be inflamed. When slimy matter is passed, we are certain that the inner coating of the bowel is highly inflamed; and when there is a constant straining we know that the lower and larger bowel is affected.

The affection may become chronic, after repeated attacks of the acute form. Diarrhœa is often set up by more serious affections, as typhoid fever, malarial fever, &c.

Treatment.—In Africa, if you feel sure that the diarrhœa is due to malaria, do not stop it. If you have occasion to think that

indigestible substances are causing irritation, give 3 or 4 teaspoonfuls of castor oil with 20 drops of laudanum (tincture of opium). If the pain is acute, apply poultices to the abdomen. Give non-irritating foods—milk with lime-water, or milk boiled with rice and strained. Give barley-water to drink, or weak tea and toast, leading on to fish and chicken.

If it is due to cold, keep in bed and take 10 drops of laudanum every three or four hours. Chlorodyne in full doses is excellent.

Constipation.—This is habitual costiveness, or a prolonged departure from the normal motion of the bowel. Most people go to stool once in twenty-four hours, but some do so every second or third day. In constipation the functions of the stomach, liver, pancreas, or bowel itself are imperfectly performed. This leads to a variety of troubles. The countenance becomes sallow, the breath foul, the skin dry, and the head aches. Often it is associated with a weak state of health, sedentary employment, want of exercise, and constant disregard of the calls of nature. These lead to all sorts of complications.

Treatment.—For temporary constipation take 3 teaspoonfuls of castor oil in beef-tea, as recommended on page 176; or take 5 grains of calomel and 15 grains of jalap. For habitual constipation let the diet be regulated. Brown-bread, oatmeal porridge taken occasionally, together with figs, prunes, &c., are on the right lines. The bread made from the wheat in Africa, introduced by the Arabs, is excellent for this purpose. Vegetables are good. Cultivate a regular habit of defæcation, and to this end go immediately after breakfast every day, whether there is desire or not. Take plenty of exercise in the open air and a tepid bath once every day. Friction over the abdomen is good, especially rubbing downwards on the left side. If the patient can bear it, a dessert spoonful of pure olive oil every morning after breakfast is both a laxative and a food. Of medicines the liquid extract of *Cascara Sagrada* is good, only first remove the existing constipation, then take every night, 30 drops for two months. By this time the habitual constipation will have quite disappeared. The following is an excellent pill:—

Extract of nux vomica	.	.	.	$\frac{1}{2}$ grain,
Sulphate of iron	.	.	.	$\frac{1}{2}$ "
Powder of myrrh	.	.	.	$\frac{1}{2}$ "
Powder of soap	.	.	.	$\frac{1}{2}$ "
Aloes	.	.	.	$\frac{1}{2}$ "

Another excellent method, for certain persons, is to inject into the bowel, during the early morning, from 30 drops to a table-

spoonful of glycerine. This lubricates the lower bowel and sets up normal action. (*See* Glycerine syringe, p. 175.) A piece of soap cut like a finger, and inserted into the bowel, is excellent. Enemata of soap and warm water, to which some castor oil may be added, is very efficient.

Colic.—This is a severe twisting or griping, spasmodic contraction of the bowel. It is generally due to the presence of indigestible food. In Europe it is common amongst those who work in lead or copper. The griping begins about the region of the navel and spreads over the whole of the abdomen. These pains change their position frequently, and are always relieved by pressure, and never aggravated by it. In extreme cases the sufferer may be “doubled up,” with his abdomen hard and tense. The pain is felt to be “coming on,” increases till it reaches a climax, and as gradually passes off. There may be faintness, perspiration, and even nausea, but there is no fever. The face looks pale and anxious, as if something dreadful were impending, and the surface of the body may be cold and covered with sweat.

Treatment.—If the case is mild give a brisk purge of castor oil, 3 teaspoonfuls, laudanum 30 drops. Before this acts put the sufferer in a hot bath of 104° F.; place a large moist warm poultice over the abdomen and order rest in bed; or hot turpentine stupes may be used instead of the bath. Relief is afforded by a hot indiarubber bottle being placed over the stomach. The pain goes off as soon as a motion is obtained. Should no relief be afforded, a hypodermic injection of morphia should be given, say $\frac{1}{8}$ grain of the sulphate, along with a glassful of hot punch. Chlorodyne is a popular and excellent remedy, and should be given in 30-drop doses till the pain is relieved.

Inflammation of the bowels.—This is a catarrh of the bowels. Sometimes the whole length of the bowel is affected, from the stomach to the anus. More commonly part only of this long surface is inflamed. It is brought on by the same causes as inflammation of the stomach, namely, bad foods and bad water. The signs vary according to the seat. Usually there is diarrhoea, but no blood is seen unless an ulcer is present. If the large intestine is affected there are recurring colic-like pains, with soreness on pressure, flatulence, rumbling, and distension of the abdomen. If the upper part of the small bowel is inflamed then jaundice is present. If it becomes chronic there is continuous diarrhoea with watery offensive stools, or it may even be that the food is passed as it has been swallowed. It is impossible to separate this affection from ordinary diarrhoea; should, however, slimy mucus be present in

the stools then we have a sure indication that the large bowel is inflamed.

Treatment.—Give only non-irritating foods, as weak soup free from all solids. It is not wise to at once stop the diarrhœa, as nature is throwing off something injurious to the system. If indigestible food is suspected, give castor oil as indicated above. If there is a tendency to mucus and little streaks of blood, give 15 grains of Dover's powder, repeated, if necessary, every four hours ; or the following :—

Subnitrate of bismuth . . .	20 grains,
Tannic acid	3 ”
Dover's powder	3 ” every four hours.

If the tenderness is located to one spot, as over the right side, the sufferer will incline to lie on that side, with the legs drawn up. Poultices and fomentations in such a case will give great relief.

Dysentery.—Another name for this disease is “bloody flux.” It is caused by a specific germ, which sets up a severe inflammation and ulceration of the mucous membrane, and it may be of other tissues of the lower end of the large bowel and rectum. It occurs sometimes in malarious countries as an epidemic. It is very common in Africa, where the sufferer has been exposed to great fatigue, under a blistering sun, together with badly cooked food, worse water, and tinned meats. The disease usually begins in the right groin and works up the bowel. The signs of the disease are, however, most pronounced near the rectum. In mild cases patches only of the bowel are affected, but on the other hand great ulcers may be present. In very severe cases patches of the mucous membrane may die and be discharged. In a typical case there is, for a few days, irregularity of the bowels with pain and lassitude ; then fever sets in with shivering, gripes, and very frequent desires to go to stool. At first fæcal matter is passed in little nodules, but soon the stools are composed of mucus and blood, with shreds of mucous membrane. The fluids in the stools are puriform and very offensive. The fever, when this is so, is high and markedly intermittent in type. The features of the sufferer are pinched, and the expression is that of great anxiety. The seriousness of the case is usually estimated by the straining at the bowels. In a severe case stools may be passed every few minutes for days. In less severe cases the tenesmus may occur twenty times a day. The patient strains with great persistency, always feeling as if he had something to part with, but passing oftentimes only as much mucus as would cover a shilling piece. In a favourable case improvement sets in in a week. If the

patient is sinking, great perspiration appears and hiccough harasses the weakened frame. In other cases the disease becomes chronic after frequent relapses.

Treatment.—As soon as this disease is apparent let the patient be put in as comfortable a room and on as good a bed as possible, for rest in the recumbent position is absolutely necessary. In mild cases, where little hard lumps are passed, begin with a full dose of castor oil (3 teaspoonfuls), and for two days after give 1 teaspoonful of the same oil with 20 drops of laudanum. In severe cases, where only mucus and blood are being passed, do not give the above oil, but apply several fomentations, as hot as can be borne, to the abdomen, to relieve the pain and calm the bowel. If the pain is very great, give $\frac{1}{8}$ to $\frac{1}{2}$ grain of morphia hypodermically. The one recognised specific for dysentery is ipecacuanha. At the beginning of its administration, however, it is almost certain to act on the stomach and set up vomiting. If we try it again and again, we will reach the point when the stomach will tolerate the drug, and then half the battle is over. My treatment is the following: fifteen minutes before administering the ipecacuanha give 30 drops of laudanum, then give a full dose of the pure powder—say 30 grains—keep the patient absolutely still in the recumbent position, and the desire to vomit will be overcome. If vomiting persists, continue the ipecacuanha, but in addition put a mustard poultice over the stomach, and give $\frac{1}{8}$ grain of morphia hypodermically. When this drug has been taken several times, the stomach will tolerate it. The sufferer should seldom rise from the recumbent position, and the hot fomentation cloths or poultices, or turpentine stupes, should be constantly applied. When the stools assume a natural appearance stop the ipecacuanha, and let the diet consist of milk and gruel, weak broth or eggs. (*See Sick Diet*, p. 193.) Every form of irritable diet should be scrupulously avoided. Spirits, in small quantities, are necessary to keep up the strength.

Some recommend, instead of ipecacuanha, laxative doses of Epsom salts, with dilute sulphuric acid. Injections of nitrate of silver (20 grains to 2 tablespoonfuls of water) are highly spoken of. They should be given after the patient has had a hypodermic injection of morphia. The bowels should be washed out twice every day (say morning and evening) with warm water, and about mid-day an enema of starch and laudanum (say 40 drops) should be given. This free washing should be an accessory to whatever form of treatment is adopted. Every discharge from the patient should be disinfected with Condyl's fluid (permanganate of potash), or carbolic acid, or strong solution of sulphate of iron, and immediately buried.

Treatment of chronic dysentery.—In this case all the above acute symptoms are gone, and there is only very irregular action of the bowels, with the passage of mucus. The patient has lost so much flesh during the many months or years of his illness that he is now verily a “walking skeleton.” Medicines in such a case do little good. Let him take tonics of quinine and iron in full doses, such as the following, three times every day before meals :—

Quinine	.	.	.	.	.	.	2 grains,
Ferri redacti	.	.	.	.	.	.	1 „
Powder of digitalis	.	.	.	.	.	.	1 „
Extract of gentian, as much as required.							

Use enemata of nitrate of silver every day in the proportion of 2 grains to 2 tablespoonfuls of water. A flannel bandage should be worn habitually, and above all the sufferer should leave his present surroundings and go for a change. Let only non-irritating diet be taken.

There is a form of dysentery which appears in connection with fever. In this case ipecacuanha does no good. Give instead small doses of quinine, say 3 grains three times a day, together with 30 drops of the perchloride of iron freely diluted in water.

In the treatment of ordinary dysentery there is a drug named lungili, which has been highly spoken of. It is the powdered bark of a tree which is native to East Africa. It is given in the following way. The bark is powdered and intimately mixed with a little milk. When about to be taken a little fresh milk is poured on the mixture and it is swallowed. It can also be taken in beef-tea, wine, or even water.

WORMS WHICH INHABIT THE DIGESTIVE ORGANS

There are about thirty different parasitic worms which have been described as inhabiting the human subject. They reach the tissues in the form of ova, imbedded in imperfectly cooked food or impure water. When they reach a suitable nidus in the bowel or other tissues, they go through another stage of their life history. They live by absorbing fluids. Most of those known to science are found in Africa, and I feel persuaded that there are some in that continent not yet known. They may be divided into three groups :—

I. Tape-worms.—There are three different kinds of these. It is well to bear in mind that this group has two marked phases of

existence. Segments of the mature worm, containing eggs, are discharged from the bowel of the host, and drying up, are blown about in the air, till they reach water or some damp locality. In time an egg reaches the bowel of an animal, which suits it, say a pig, and develops, so that an embryo begins to live, and bores a passage through the intestinal wall into the tissues of the animal. Here it develops a head and neck and bladder-like body. In this situation it may lie dormant for years, until the flesh of its host reaches the intestine of another animal, say a human being. Here the second stage of its life begins. The bladder-like body is cast off, and segments grow from the head, until it may attain to many feet in length.

When these tape-worms are in the human subject the *symptoms are the following*. There are pains in the bowel of a colicky nature, and itching at the nose and anus. Sometimes, however, these signs are not well marked, so that they are not to be relied upon. The passage of segments of the worm is the only reliable sign of its presence.

Treatment.—In the endeavour to expel the parasite from the system it is well to prepare the bowel by taking no food for a day and a night beforehand. Then take four teaspoonfuls of castor oil in beef-tea or other fluid. In the morning, after the oil has operated, take, on an empty stomach, one teaspoonful of the extract of malefern in milk, or give this drug as prepared by Burroughs, Wellcome & Co., which is excellent in its mode of preparation and action. Another good drug is a decoction of pomegranate. Three hours after swallowing either of these drugs, take a dose of castor oil similar to the above, and carefully examine the stools for the head and neck of the worm. If the head is not passed, the worm will develop again in about three months.

II. Round-worms.—This form of worm is very common in Africa. All in this family are solid and round, and taper at both ends, and may be nine inches or a foot in length. The sexes are distinct. There may only be one in the bowel, but usually there are two or more. They reach the body in the drinking water; the eggs having very strong envelopes, resist heat and cold. The symptoms of their presence are the same as in the case of the tape-worm, namely, colicky pains, great appetite, nausea, &c. Unless we actually see the worms we can only surmise that they are present.

Treatment.—Prepare the patient by fasting and castor oil, as in treating the above. Then give an adult 6 grains of santonine, a child about 3 grains. Let the drug be given for four mornings in succession, and every time on an empty stomach. On the second and fourth afternoons, give a full dose of castor oil in beef-tea.

III. **Thread-worms.**—These are the most common of all the worms, and as they are generally found in those who are poorly clad and fed, they are often seen in Africa. The worms are white and small, and look like little bits of sewing cotton. They infest the rectum, and are always found in great numbers and chiefly in young people. The most characteristic symptom of their presence is the itching at the anus and nose.

Treatment.—This is the same as for the round-worms, only, in addition, it is well to inject into the bowel a strong infusion of quassia, say to the extent of two cupfuls. The parts should be sponged with Condyl's fluid, and dusted with starch or oxide of zinc or flour. Some recommend 3 grains of calomel and 10 of jalap for three successive nights; thereafter an enema of cold water and common salt.

In order to *prevent* the recurrence of these pests, carefully avoid all raw and underdone beef or pork. See that the cook washes thoroughly all vegetables used at table. Boil and filter all water. Keep the bowels freely open.

Congestion of the liver. (*See Fig. 8.*)—A slight increase of blood in the liver takes place immediately after a meal, and the digestive act has set in. When, however, food or drink is taken to excess, this congestion is apt to exceed due limits. The sufferer becomes irritable and depressed. He has constant headache and general "out-of-sortness." He has a feeling of dead weight and fulness on the right side underneath the lower ribs. He has a bad taste in his mouth, and no appetite for food. There is constipation, and it may be a dull pain passing up to the right shoulder. There may be vomiting and jaundice.

The above stage may pass on to **acute inflammation of the liver**, which is brought about usually after great exposure to fatigue and heat, in a malarial country. The drinking of spirits is usually at the bottom of the illness. Pus may form in the organ.

Treatment.—Enjoin rest in bed; give a bland and non-irritating diet, and forbid all stimulants. Act freely on the bowels by giving 5 grains of calomel and 15 grains of jalap, or give two of Burroughs, Wellcome & Co.'s cathartic tabloids, which consist of colocynth, jalap, and mercury. Ipecacuanha acts admirably in cases of this kind. Give of it 15 grains, and before doing so put a mustard poultice on the region of the stomach. Don't be discouraged if the stomach parts with it once or twice, but try again. Medical men could do much more in severe cases, especially if the case ran on to an abscess, but it is not necessary here to indicate the line of treatment. The local pain can be relieved by fomentations

or poultices, or even blisters, over the region of the liver. I have known of great relief having been given by painting the surface of the liver with ordinary blistering fluid.

Jaundice.—This is not a disease but a symptom, yet it often sets in suddenly, and persons far away from medical aid are called upon to do their best for its treatment. Jaundice denotes a yellowness of the skin of the body, and is specially apparent in the white of the eyes. The tissues of the whole body may be stained yellow. The urine in such cases is black and will stain linen. There is a bitter taste in the mouth, constipation is prevalent, while the stools that are passed are clayish or even white. The skin is often very itchy.

Treatment.—First of all endeavour to find out the cause. If it is due to excessive congestion, then treat for congestion. In Africa jaundice is often seen in the course of the serious forms of malarial fever. In the bilious remittent fever there is a hyper-secretion of bile, as manifested by the bilious vomiting and purging, high coloured urine, and the malarial jaundice. In such a case authorities recommend calomel in 20 or 30-grain doses, to be given at the outset of the symptoms, and repeated in the same large doses, or it may be a little less (say 10 to 20 grains), during the illness. The calomel in such cases acts like a purgative. Three hours after the administration of the calomel give a Seidlitz powder.

As the bile is chiefly passed out of the system by the kidneys, act on them freely. Give the patient large draughts of warm liquids, such as gruel. A skim-milk diet is excellent. *Sugar, fats, and all alcoholic stimulants* should be carefully avoided. Wear warm clothing, and give a hot bath twice every day. Pilocarpine acts well here in relieving the jaundice, and in removing the itchiness of the skin. It can be given in doses of about $\frac{1}{4}$ grain hypodermically. This drug acts most admirably.

Enlargement of the spleen. (*See Figs. 8 and 9.*)—The normal spleen lies in the left side of the body. In a line drawn from the left armpit down the side it is found to lie from the seventh to the twelfth ribs. It often enlarges enormously, and extends down, and in, towards the navel, and may form a tumour of immense size. It is movable, and shifts its position according to the posture of the body. Congestion of the spleen occurs in connection with malarial fever, and this often repeated leads to chronic enlargement. There is then a sense of weight in the left side, and it may be tenderness.

Treatment.—Recent enlargement disappears under the influence of the remedies used in malarial fever—quinine, &c. In the older forms, however, the enlargement remains. In such a case, take a

piece of the biniodide of mercury, and sitting before a warm fire, rub the drug briskly over the organ as long as possible. By this means the mercury will be absorbed by the skin. Do this every day, and relief will be obtained. This treatment acts admirably upon a hard indurated spleen due to malaria. If there should be localised pain apply a small blister, or paint the part with blistering fluid. On the whole, however, the organ is not very responsive to treatment. It is fortunately not a very serious affection. Good food, tonics of iron, such as Easton's syrup, mineral acids, and a change to a healthy locality are indicated.

CHAPTER IV

DISEASES OF THE RESPIRATORY SYSTEM

STRUCTURE AND FUNCTIONS OF THE RESPIRATORY ORGANS

RESPIRATION or breathing is a part of the life of every organism, whether vegetable or animal. It consists of the absorption of certain gases from the air, as oxygen, and the giving off from the system of deleterious substances, as carbonic acid. The mechanism of respiration in mammals consists of the *lungs*, which are one vast series of air-chambers into which the outer air enters, with a *minute network of blood-vessels* covering these chambers. There are extremely minute membranes between the circulating blood and the free air, so that gases transfuse freely from one to the other. The blood, as it comes from the right side of the heart and the tissues of the body, is loaded with carbonic-acid, water and urea, and is of a dark-blue tint; coming into contact with the air it assumes a scarlet red colour. This change of colour takes place when the blood is brought into close contact with the air of the air-chambers of the lungs. The essential structure of all respiratory organs—lungs of a mammal, gills of a fish—are the same, namely, a thin membrane exposed on one side to the oxygen of the air or water, and on the other to the blood flowing in a very fine network of vessels. The gases pass freely through this membrane. The simplest form of lung that we can conceive of is an elastic bag with air inside and blood outside, having a tube to allow the egress and ingress of air. This is exactly the structure of our lungs, only they are complex, so as to allow an extended area of contact with the air.

The lungs.—The nose and mouth join the upper part of the gullet in a cavity known as the pharynx. (*See Fig. 4, p. 25.*) From the pharynx arises the windpipe or trachea. (*See Fig. 6.*)

The voice-box (*larynx*) is at the entrance to the windpipe, and is easily felt in the front upper part of the neck, and is

popularly known as Adam's apple. In its interior are the cords for the formation of the voice. The windpipe (*trachea*) is the passage downwards from the voice-box, and is also felt in the neck. Its sides and front are provided with rings of cartilage which keep it open. As soon as it passes from the region of the neck into the chest it divides into two tubes known as the bronchi, one of

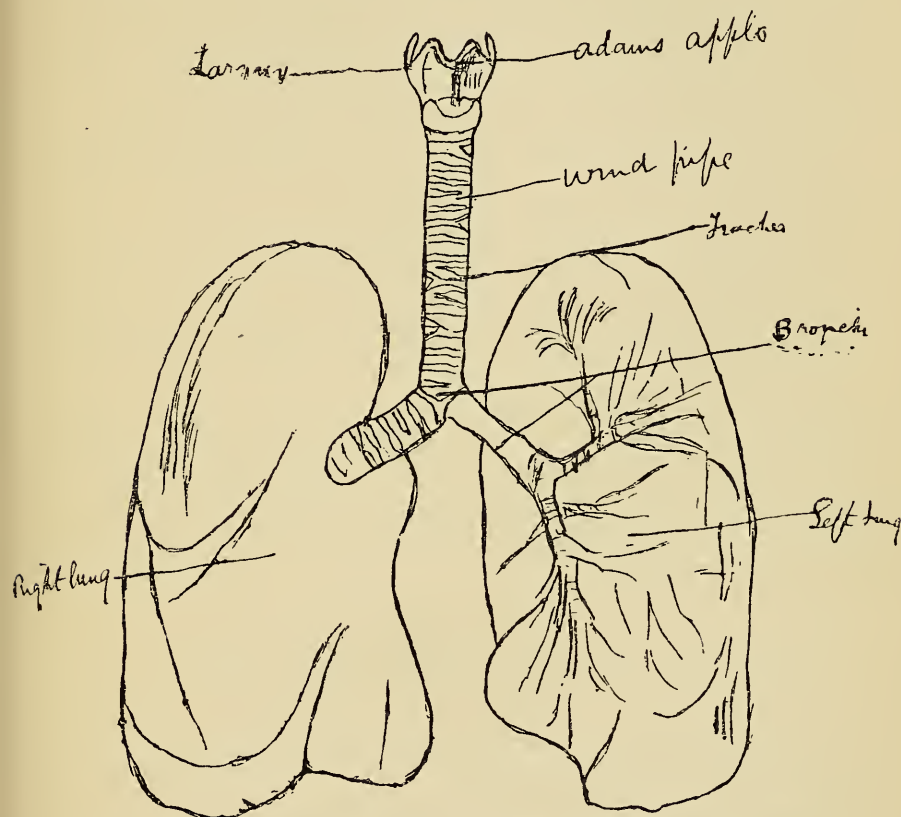


FIG. 6.—DIAGRAMMATIC VIEW OF THE WIND-PIPE AND LUNGS.

(The left bronchi is shown to ramify in the tissue of the lung.)

which goes to each lung. All the tubular ramifications of the bronchi are lined with a fine mucous membrane, the mucus of which lubricates the passages. The *lungs* themselves are two huge bellows or spongy structures of a purplish colour, which, together with the heart and the large blood-vessels, fill the cavity of the chest. Each lung is covered with a fine membrane named the *pleura*, which, after it invests the lung, passes over the inner surface of

the cavity of the ribs (*thorax*). There is a fluid secreted in the cavity of the pleura, which allows the bellows-like lungs to expand freely. The bronchi divide over and over, ordinarily into two, until they lose themselves in the air-chambers of the lung. (*See Fig. 7.*)

These minute chambers are estimated as being $\frac{1}{100}$ th inch in diameter, and to be about 725 millions in number, and that, if spread over a flat surface, they would cover 2000 square feet. The walls of these minute air-chambers are formed of the thin membrane in which the blood and lymph capillaries ramify. A very great amount of elastic tissue enters into the structure of these minute membranous walls, and this allows of their elasticity.

The chest is an air-tight chamber. The walls of the chest are formed of the ribs, backbone, the breast-bone, and muscles. These together form the mechanism of respiration.

It is estimated that some four hundred cubic feet of air pass through the lungs in one day of twenty-four hours. This air escapes, charged with carbonic acid, watery vapour and other impurities. What, therefore, is imperative to health is that there be free circulation of air in our homes.

But there is another respiration going on in the system, namely, the passage of the oxygen of the blood into the tissues, the use that is made of that oxygen by the minute cells resulting in carbonic acid, and the mode by which this carbonic acid is taken to the lungs and thrown forth. This is often named the "*Inner Respiration.*"

DISEASES OF THE RESPIRATORY ORGANS.

As in Africa these organs are seldom seriously involved, it is not necessary to dwell on them at length. The following are general symptoms of the organs being affected :—

Dyspnœa is applied to any alteration in the regularity of the breathing. It may be rapid or laborious. The depth of the respiratory act is generally in the inverse proportion to its frequency. Dyspnœa may be due to nervousness ; or, on the other hand, may be due to an abnormal condition of the blood. It is seen when the blood is overheated, or if there is any obstruction to the passage of the air, as in inflammation of the lungs. A person in fever often pants like a sheep.

The respiration is very slow in fainting, collapse, and in affections of the brain.

Cough is a violent expiration of air after a long-drawn inspira-

tion. A cough may be simple or it may come in paroxysms. It may be dry. The loudest cough is seldom the most serious.

Expectoration.—In health it is seldom necessary to spit, but in affections of the air-passages there may be a great deal of mucus secreted, which may be more or less frothy. Pus or blood may be present. Viscid, purulent-looking lumps may come away.

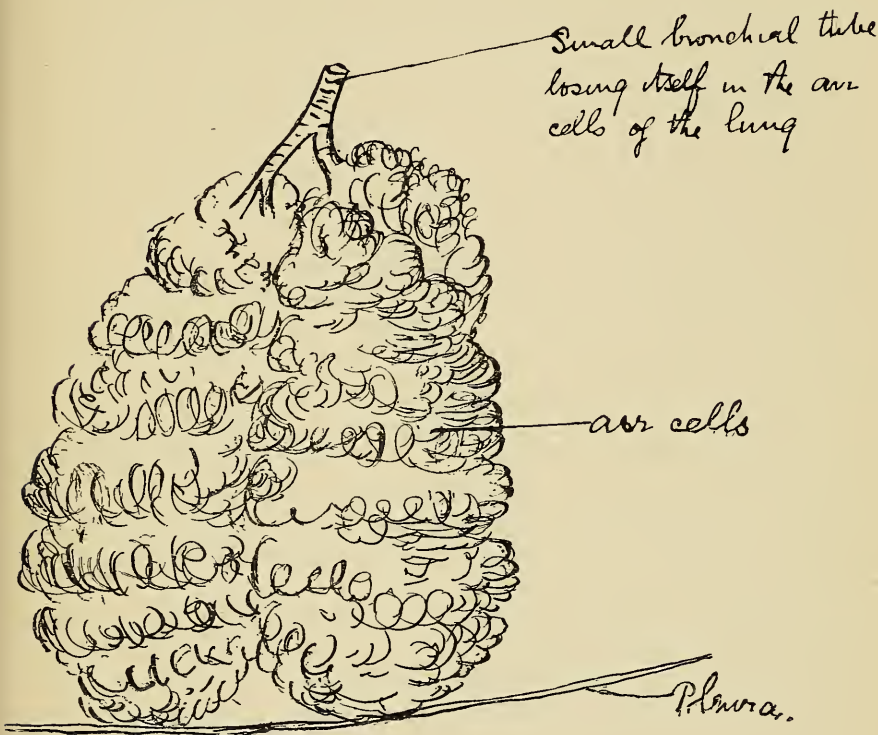


FIG. 7.—BRONCHIAL TUBE PASSING INTO THE AIR-CELLS OF THE LUNG.

(The Pleura is shown diagrammatically to be covering the lung.)

A cold (catarrh).—An ordinary cold is an inflammation of the nostril, pharynx, larynx, and upper part of the windpipe leading down to the lungs. (See Fig. 4.) Any sudden change from warmth to cold, even in the most robust, will set up the affection, but in the weakly it is easily brought about. It begins with a feeling of chilliness, perhaps a shiver, and the temperature will be found to be 101° F. or so. There is frontal headache, dryness in the

nose, followed in a day or two by excessive secretion. The membranes are at first red and swollen. The pharynx, larynx, and trachea may all be involved. There may be hoarseness and a tickling cough. A cold may extend down to the bronchial tubes, in the very young or very old, and be serious.

Treatment.—If taken at its commencement a warm bath is good. Bathe the feet and legs in hot water with a little mustard; give 5 grains quinine, or 15 grains antipyrin, or 10 grains Dover's powder, and retire to bed with an extra blanket. If this is done at the onset of the illness, in all probability the affection will be cut short. The following is an excellent mixture for arresting and curing a cold, relieving influenza and other chest affections: menthol, camphor, and oil of eucalyptus in equal proportions applied locally relieves the swelling and irritability of the cold, allievates the pain and fulness of the head, and stops the sneezing.

For sore throat or hoarseness give inhalations of steam with the compound tincture of benzoin (a teaspoonful to two tumblers of boiling water). Gargles of cold water with chlorate of potash and glycerine of tannic acid is good. Mustard to the chest is good. Chlorodyne, which is always at hand in Africa, is excellent.

Bleeding at the nose occurs as an important symptom in some diseases. It is readily excited in some constitutions about the period of puberty. It occurs also from local causes, as in congestion of the nose and catarrh. In those of an over-full habit, and in those who suffer from congestive headache, bleeding gives relief, and should not be stopped.

Treatment—Place the subject upon his back with the shoulders and head moderately elevated. Let the arms be raised above the head, and press the bleeding nostril. If this fail, put cold on the temples and mustard to the calves of the legs. Hot foot-baths are good if given when the subject sits in a chair.

Ozæna.—This word comes from the Greek, meaning *a stench*. It is applied to all diseased conditions of the nose, accompanied by great fœtor of the breath. It may arise from many causes, but usually from an inflammation of the mucous membrane, in which there is a morbid secretion of crusts in the cavity of the nose and an offensive odour.

Treatment.—Absolute cleanliness is the one essential. We are very apt to wash with scrupulous care the body itself, and forget the mucous passages, such as the ears, nose, throat, genitals, and bowels. The difficulty in ozæna is to remove the thickened secretion. Wash away every crust: so long as these are present in the nose, so long will the surface be kept from healing. Wash the

nose thoroughly by means of the nasal douche and warm water, in which is placed a teaspoonful of common salt, or a teaspoonful of bicarbonate of soda, or a pellet of permanganate of potash. Do this till every trace of crust is removed. In very bad cases use inhalations of steam to assist the stream of water. When the cavity is thoroughly cleansed, use on cotton the following antiseptic solution : permanganate of potash (1 grain to 20 tablespoonfuls of water), boracic acid (2 drachms to 20 tablespoonfuls of water), perchloride of mercury (1 or 2 grains to 20 tablespoonfuls of water). Insufflation of aristol and iodol in powder is also most useful.

Laryngitis is an inflammation of the larynx or voice-organ. It usually results from cold, exposure, or from some irritant. The vocal cords are inflamed, and the voice hoarse ; there may also be some difficulty in breathing. Should this latter be present, there is marked distress : the face is flushed, and the lips are blue. The cough is harsh and croaking.

Treatment.—Keep the temperature of the room, if possible, always about 65° or 70° F. The treatment in the early stages is the same as in a cold. Ipecacuanha is useful, as it brings about vomiting, which clears the throat. Give the ipecacuanha in teaspoonful doses. The inhalation of a few drops of chloroform will relieve the spasm. Let the diet consist of milk and cooling drinks. If there is great difficulty in breathing, the doctor must be sent for.

Bronchitis is a catarrhal inflammation of the mucous membrane of part or of the whole of the air passages. It may be acute or chronic, and it may be limited to the larger tubes of the bronchi, or it may extend into the smallest ramifications. The chronic form is not often seen in Africa.

Acute bronchitis is endemic in Britain. It commonly begins as a cold. There is sore throat, nasal discharge, and a cough. Then the pulse becomes quick, with thirst and general feverishness. There are symptoms of something obstructing the breathing, with a distressing cough, and pain in the region of the breast-bone. Headache is common. In three days or so there is an abundant secretion, at which stage the greatest part of the discomfort is over. At first the expectoration is watery, then tenacious, and, lastly, somewhat purulent. If the disease is only in the larger divisions of the bronchial tubes, after a lapse of ten days or so the breathlessness goes, the cough is less, the expectoration free, and the general uneasiness at an end. But if it travels to the smaller tubes of the bronchus, the breathlessness is increased, the cough is more persistent, the expectoration more difficult, and there is a tendency to choke.

Treatment.—Keep the patient in bed. If seen at the beginning give a Seidlitz powder or a full dose of Epsom salts, with 4 grains of Dover's powder. Put strong mustard poultices on the chest. When the expectoration is free, it is to be looked upon as a good sign, especially in children. In such a case give an emetic, as the act of vomiting clears the bronchial tubes. Ipecacuanha in any of its forms assists the expectoration.

Pneumonia.—This is an inflammation of the lung tissue itself, and is due to a low form of diplococcus multiplying in the lung tissue. Like bronchitis, it very frequently is the result of cold, and occurs in Africa very often during the cold season or at the beginning of the rains. When it is acute, and when it attacks a healthy person, it runs a very definite course. Usually, before it sets in, there is a day or two of marked "out-of-sortness," then there is sudden and severe shivering. On taking the temperature, it is 103° F. or more. In a few hours rapid breathing is marked, with cough and pain in the inflamed side. The patient at this stage inclines to lie on the back. The cheeks are flushed, the nostrils dilated, and it may be little dark spots appear on the lips. The breathing is very shallow and frequent, out of all proportion to the pulse. (The normal ratio is one breath to four beats of the heart.) Cough is usually present, and is very harassing, as it aggravates the pain. The sputum is sticky, and in colour is reddish-brown or rusty, which is due to the intimate admixture of small particles of blood. The skin is dry and parched, and may have a slightly yellow colour. The urine is dark. The sufferer has a great tendency to tremble all over, and is often delirious at night.

Improvement generally takes place from the fourth to the ninth day, when the temperature comes down with remarkable suddenness. As in malarial fever, perspiration is very profuse, and the relief is immense, delirium and other serious symptoms disappearing. The cough may, however, remain, but the expectoration changes markedly in colour and in profuseness.

This disease varies greatly according to the health of the patient, the constitution, and the amount of lung involved in the affection. The danger is greatly increased if the other lung be involved. Death usually ensues from suffocation.

Treatment.—Rest in bed is absolutely necessary. The treatment is chiefly a matter of nursing. Absolute quiet should be insisted on. The diet should be fluid, and some palatable drink given in teaspoonfuls, as the sufferer is often very thirsty. No drugs can shorten the course of the disease after it has set in. A good purge of calomel 4 grains, jalap 10 grains, will often give relief. (Always use

a bed-pan, as the sufferer cannot get out of bed.) To allay the severe pain apply mustard-poultices for half-an-hour, and cover the inflamed part most carefully with cotton. Blisters to the affected part, as also hot fomentations, are good. Stimulants are as a rule required, and should be given frequently, and in teaspoonful doses. Delirium should be treated with bromide of ammonium, 20 grains. Maintain the strength of the patient by extract of beef, beef-tea, eggs, and milk, remembering that the crisis comes with the sudden fall of temperature, from the fifth to the tenth day.

Notice the sputum, and if it is offensive, disinfect it by Condy's fluid, and remove at once.

After the patient has recovered, be on the look-out for a relapse. See that warm clothing is worn, and as soon as possible let him be removed to a sheltered district.

Pleurisy.—This is an inflammation of the investing membrane of the lung named the pleura. It is very often associated with disease of the lung tissue itself (pneumonia). In the acute form it begins as a congestion, followed by dryness of the membrane, which has a dull lustre. It is commonly due to exposure to cold and wet, especially when the body is perspiring, or to a blow on the chest wall. It is often secondary to other affections, as typhus fever. The onset is marked by a sudden rise of temperature, say to 100° or 102° F., but it rarely rises as high in this respect as pneumonia (104° F.), and is not so regular in its course. The bowels are usually constipated, the tongue coated, and great thirst complained of, as in other fevers. There is breathlessness, the sufferer breathing quickly, and in a shallow manner. He complains of a "catching," lancinating pain, or a "stitch," and this is an early and pronounced symptom. There is a cough, but it is not so marked as in pneumonia, and there is no expectoration. The posture of the patient in bed is full of instruction. In the early stage of the disease, when there is great pain, owing to the two coatings of the pleura rubbing together, he seldom lies on the affected side, as the pressure increases the pain. About the fifth day, when fluid has been poured out, the patient has difficulty in breathing, and the pain being less, lies on the side that is affected—doing this to give the other lung full play. The face is anxious, but not flushed as in pneumonia.

Treatment.—The first thing to do is to secure for the lung that is disabled as much rest as possible; next, to apply something that will relieve the distress and pain. To this end some apply a plaster of Paris jacket to give rest to the affected side, and relieve the rubbing of the pleura and the pain. When there is severe stabbing pain apply a fly-blister over the spot, and give 20 grains of

quinine. Dry cupping, after the fashion of the natives, is good. Both of these, the blister and the cupping, draw blood to the superficial parts, and so relieve the congestion beneath. To further relieve the pain, give $\frac{1}{2}$ grain of morphia hypodermically. A Seidlitz powder or Epsom salts is very good at this stage. The common medicine—chlorodyne—is excellent, and is in every African outfit. According to the site of the pleurisy and its stage, turpentine stupes, or the strong liniment of iodine, may be applied. In order to correct the abnormal perspiration, $\frac{1}{8}$ grain of pilocarpine hypodermically is excellent. If the pleurisy has a tendency to become chronic, mercurial ointment rubbed on the side of the chest is on the right lines. The diet should be light and very nourishing, but fluids in quantity should be discarded.

Sometimes the fluid poured out into the pleural cavity does not dry up as desired ; in such a case we resort to medicines which cause a great flow of urine, or to those which bring about watery stools. The following is on these lines : sulphate of magnesia, 30 grains. Should, however, breathing be embarrassed, or the heart displaced by fluid in the pleural cavity, or should fluid remain stationary for a considerable period—say two or three weeks—the physician could perform the operation of “tapping the chest.” This is done by the aspirator needle.

CHAPTER V

DISEASES OF THE CIRCULATORY SYSTEM

STRUCTURE AND FUNCTIONS

CIRCULATION is the term used to designate the course of the blood from the heart, through the arteries, to the minutest capillaries (which supply the tissues with nutriment), from these back through the veins to the heart. It is a circle of rotation that is ever going on by night and by day.

The heart is the central organ of the circulatory system, which acts as a force or a suction-pump. It is simply one of the arteries more highly developed in its muscular coat than its fellows. (*See Fig. 8.*) The human heart lies in the chest between the two lungs. It has two receiving-chambers or auricles, of which the right receives all the impure blood coming from the head and body, while the left receives the purified blood coming from the lungs. The two auricles pass their contents to the ventricles, which are enormously powerful pumping-chambers. The right ventricle pumps, with great force, its blood through the lungs, and the left ventricle, with even greater force, pumps its blood through the whole body. There are thus *two circulations*. The *first is the general circulation*, which passes from the left heart through its large vessels to the head, the arms, the viscera, and the lower limbs ; from there the blood returns by the veins to the right heart. The *second or lesser circulation* carries impure or venous blood, and passes from the right heart to the lungs ; there the fluid is exposed to the free air and is oxygenated ; from thence it passes to the left heart and on into the first or greater circulation.

When the heart is working, the two auricles contract simultaneously and force their contents onwards. This is followed immediately by a like contraction of the ventricles, also forcing on their contents. A pause ensues, when the heart rests, after which the rhythmic contraction is renewed.

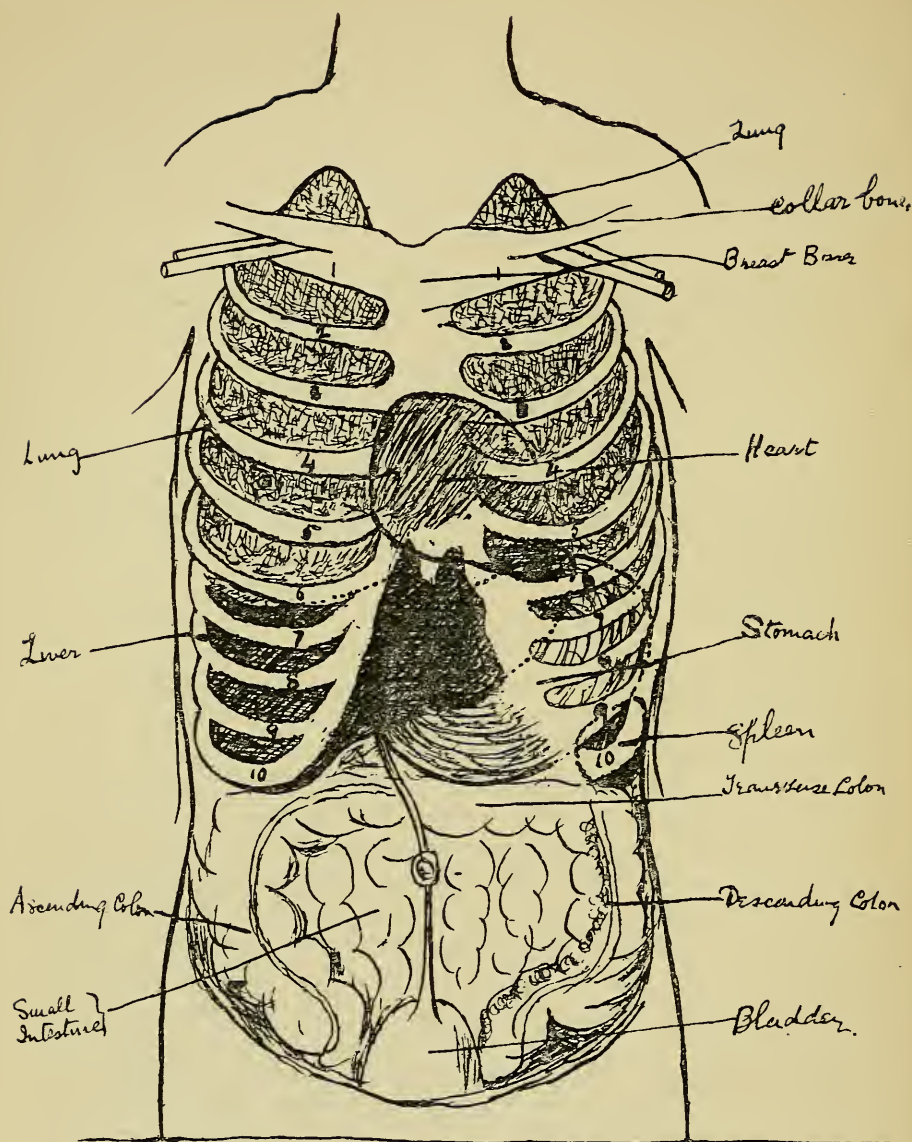


FIG. 8.—FRONT VIEW OF THE CHEST AND ABDOMEN.

(The ribs and sternum are shown in their relation to the lungs, heart, liver, and stomach. The size of the liver is shown rather diagrammatically. It is important to remember that the liver is covered by lung down to the lower edge of the sixth rib. Below that, the liver is covered by ribs and intercostal muscles only.)

There is no passage of the blood from the right side to the left side except through the lungs. It is as if a long tube had received a figure-of-eight twist upon itself. Where the one part overlapped the other, we might conceive of union in the sense that they grew and adhered to one another, but there was no passage for the fluids.

The heart lies behind the breast-bone, about the level of the nipples. It lies rather to the left side, its apex being in the intercostal space between the fifth and sixth ribs, and about three inches from the middle line of the breast-bone. Its upper surface is about level with the lower surface of the third rib. In a healthy person it beats about 70 times in a minute. In children it may beat from 100 to 120 in a minute; and in old people may only attain 50. By placing the finger between the fifth and sixth ribs, and about three inches from the middle line of the breast-bone, the beat of the heart can be distinctly felt. When a person is excited, the heart can be seen to beat in this region. What is known as *the pulse*, is merely the rhythmic contraction and expansion of the arteries leading off from the heart. The pulse can be felt wherever an artery passes over a hard substance, as a bone, and can be gently compressed between that substance and the finger of the observer.

Heart affections are not common amongst those who go out to Africa. They are often seen, however, amongst the natives. Heart affection is so vast a subject that a non-professional person cannot hope to do much in the way of treatment. The following notes on general diseases may be of interest.

Dropsy.—This is more a symptom than a disease of the heart. It is an effusion of watery fluid from the blood, into the skin and connective tissue of the body or its cavities. The fluid part of the blood transudes and fills up the spaces in the connective tissue. It occurs when the blood is watery and the heart unable to force the fluid against gravity, from dependent parts of the body, such as the lower limbs. The dropsical fluid is very much like ordinary blood serum. It is without colour, or somewhat of the tint of straw. Dropsy may be *local*, in which case it is due to something interfering with the venous circulation leading from the part. This is seen when the abdomen swells from affections of the liver. Or, again, it may be *general*. It is then due to the heart, and begins in the most dependent parts, as the ankles or insteps, and always comes on about evening. The tissues become swollen and flabby, and pit on pressure. The vitality of the dropsical tissues is lowered, so that they are very liable to low forms of inflammation.

Treatment.—The condition may hinder the subject from getting out of bed, or even moving in bed. In treating it, find out the

cause, and remove it. The absorption of the fluid may be aided by medicines which cause very watery stools, as 15 grains of jalap, or Epsom salts in very little water, or by medicines which cause great perspiration, as 10 grains of Dover's powder.

A surgeon could drain off the fluid. After having thoroughly cleaned and oiled the skin, he could make a prick and allow the fluid to trickle off, or he might insert small silver tubes.

Where the abdomen is distended with fluid (ascitis), it is sometimes absolutely necessary to remove the same, as the pressure interferes with breathing. In such a case the fluid may be drawn off. This operation should only, however, be undertaken by a duly qualified physician.

Palpitation is an increase of the action of the heart, both in frequency and in force, which causes some discomfort. It may arise from some heart affection, but may also be brought on reflexly, by a disorder of another nature. It is seen in affections of the stomach, as indigestion, or over-distension of that organ. It may come on from over-indulgence in tobacco, tea, or alcohol. The onset is sometimes sudden, occurring even during sleep, but it more often comes on after excitement or severe exertion. There is a great sense of oppression over the region of the heart, with breathlessness, giddiness, and a feeling as if the "end" had come. The heart heaves as if under some weight. The sounds of the beating are louder than usual, and the impulse of the heart seems to be conveyed even to the vessels of the neck. These abnormalities of the heart's action last for a few hours, or even days, and often go off as suddenly as they appear.

Treatment.—Try and find out the cause and remove it. Let the diet be very sparing. If any narcotic is in use, be suspicious of it and stop it. When the palpitation is present, let the patient recline on a couch of some kind, and give ether to breathe, or apply ammonia to the nostril.

Angina pectoris—breast pang—cardiac pain.—This is an affection of the heart which is characterised specially by *pain* in the region of the organ, which occurs in paroxysms. Along with the pain there are cold sweats, and a horror as of impending death. It comes on usually about middle age, and is more common amongst men. The *one* feature which characterises the disease is the *suddenness of the onset of the pain*. A person may be hurrying to a train or to an appointment, when suddenly he is arrested. The pain is like a stab in the heart, radiating down the left arm. The patient has all the appearance of having had a shock: the face is pale, anxious, and a picture of distress. He lays hold of whatever is near, lest he should fall to the ground. His legs quake, and a cold, clammy sweat breaks

over the whole frame. There is, however, no fainting and no tendency to stupor. There may be irregularity of the heart's action; but often it beats at the regular rate, as if nothing were abnormal. Death may supervene, but usually after half-an-hour the paroxysm of pain is at an end. The attacks, however, are likely to come back, and at lessening intervals.

Treatment.—Attend carefully to the general health. Avoid excitement and muscular exercise, which throw a strain on the heart; avoid all stimulants; make certain that there is no straining at stool. Nitrite of amyl, when it is inhaled in doses of from 2 to 5 drops, gives almost instant relief. It does so by relieving the spasm of the superficial arterioles, and so lowers the blood pressure. Those who suffer from the disease should carry about with them a few of the silk-enveloped glass capsules. On the approach of the spasm, break the glass over a handkerchief and inhale the vapour. After a few deep inspirations the pain is at an end. The inhalation of chloroform gives relief, and is often at hand when there is no nitrite of amyl. The chloroform should be inhaled in the usual way from a handkerchief or a towel. Another authority recommends a hypodermic injection of $\frac{1}{2}$ grain of morphia. Until these drugs can be procured, on the appearance of the paroxysm let all clothing be removed from the neck, apply hot fomentations to the region of the heart, and give hot stimulants, as brandy. In malarial cases quinine in large doses, say 20 grains, gives relief.

The kidneys.—These organs are two in number, having for their function the secretion of the urine. They are of the shape of a French bean. They are tubular glands, and are the largest of their kind in the human body. They are situated at the back of the abdomen, in the lumbar region. (*See Fig. 9.*) They lie on either side of the spinal column, extending from the lower edge of the eleventh rib to a little way above the crest of the ilium. The right kidney is a little lower than the left. Each organ is four inches in length, two in breadth, and one in thickness. The substance is of a dark-red colour. They may be compared to the skin, in having enormous numbers of tubes, after the likeness of the sweat glands, abundantly supplied by capillary blood-vessels. The function of these tubes, which are greatly convoluted, is to secrete from the blood, in a fluid form, the various constituents of the urine. This secretion is collected into a cavity in the kidney, passed on through the ureter to the bladder, and cast out of the system. The ureters are two long muscular tubes leading from the kidneys to the bladder. They descend in the back part of the abdomen. The bladder is a muscular bag which receives the urine

drop by drop as it is secreted. It lies in the pelvis in front of the lowermost part of the bowel.

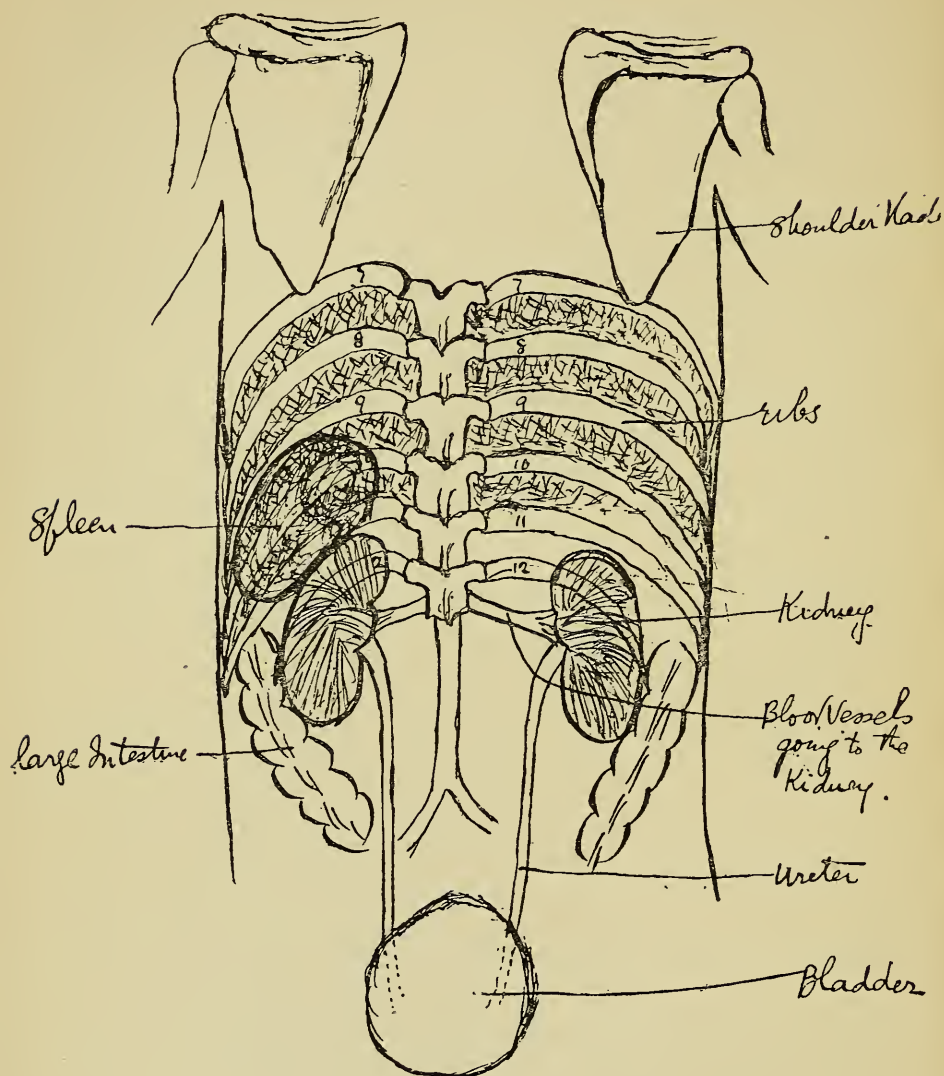


FIG. 9.—DIAGRAMMATIC VIEW OF THE BACK, SHOWING THE SPINAL COLUMN, RIBS, SPLEEN, KIDNEYS, AND BLADDER.

The urine.—It is important to have a knowledge of this secretion in health. The urine consists of waste products of the system,

and water. These, should they be retained within the body, act as poisons. The physician, by studying its amount and quality, is guided to a knowledge of the state of the kidneys. The quantity passed in twenty-four hours in health is from two to three pints (four tumblers), but it varies greatly. A healthy person should not be forced to pass urine from the hour of lying down till that of rising in the morning. This also depends on the fluids partaken of, and the state of the skin. Healthy urine is clear and transparent when passed, and on standing in a vessel may have a faint cloud of mucus suspended a little way above the bottom of the vessel. It is slightly acid, as is shown by turning blue litmus paper red. Its specific gravity is 1015 to 1020. It may vary greatly from the above and yet not indicate actual disease.

If *mucus* be present, the urine has a cloudy whitish colour; if *pus*, the urine is thick, heavy, and it may be greenish in tint. If *albumen* is present, it manifests a grave kidney weakness. In order to test this, boil a little in a test-tube, and, if present, a more or less thick cloud will appear, and this cloud does not pass off, but is rather increased, by adding a few drops of acetic acid. *Bile* when present makes the urine yellowish or greenish in colour. When such urine is spilt on linen or white clothes, it stains them yellow. Bile is always associated with jaundice. *Hæmaturia* means actual blood in the urine. If the amount of blood is small, the urine will be smoky in appearance; if great, it may be red or scarlet, or dark brown, as porter. If the blood is diffused throughout the urine when passed, it comes from the kidneys; but if it is passed in clots, it may come from the ureters, or even the bladder, or other passages. *Hæmoglobinuria* is a condition of the urine in which blood pigment is present, but very few, if any, blood corpuscles. It may be paroxysmal in form, when there is an occasional passage of dark-coloured urine. The attack may come on after the morning bath, exposure to cold, exhaustion, or an ordinary attack of tertian malarial fever. It may also be due to a toxic poison, such as bile nitrites, or the substances secreted by the parasites of malarial fever.

There may be actual suppression of the urine. This is very serious, and may indicate that the kidney is unable to eliminate the products of waste. It is seen in actual kidney disease, cholera, malignant malarial fever, &c. It is different from retention, when the urine is secreted, but the bladder has not the capacity of discharging the same.

CHAPTER VI

DISEASES OF THE NERVOUS SYSTEM

STRUCTURE AND FUNCTIONS

THE nervous system of vertebrate animals consists of two apparently distinct parts—the brain and the spinal cord. These organs are so extremely delicate and sensitive, that they are contained in very strong bony encasements. The **brain** is within the skull, and is divided by anatomists into the large brain (cerebrum), the small brain (cerebellum), and a most important part, the medulla oblongata. (*See Fig. 11.*)

In weight the brain is about fifty ounces, and in proportion to the weight of the human body it is one to fifty. In this respect man is very different from the lower animals. The cerebrum embraces the greater part of the brain substance, and presents an external, an internal, and an inferior surface. The external surface is laid out in folds and convolutions, separated by deep furrows. These convolutions consist of nerve substance, or “grey matter,” and are different from the deeper substance. This internal or deeper part is white, and encloses cavities, which are connected with other cavities, that are found in the spinal cord below. These in every healthy brain contain a little fluid. From the inferior surface there passes off a number of little processes, which go through holes in the bony case. They are known as the cerebral nerves, and some of them are the nerves of sight and smell and hearing. The small brain or cerebellum lies below the larger brain. The medulla oblongata is, in many respects, the most important part of the brain, as here are lodged the centres of action of the most vital organs of the body—the heart and the lungs. Comparatively, it is small, and lies inside the skull, at the top of the canal, in which is lodged the spinal cord.

The delicate brain has, besides the strong outer bony skull, and the coverings of skin and hair, three other very delicate mem-

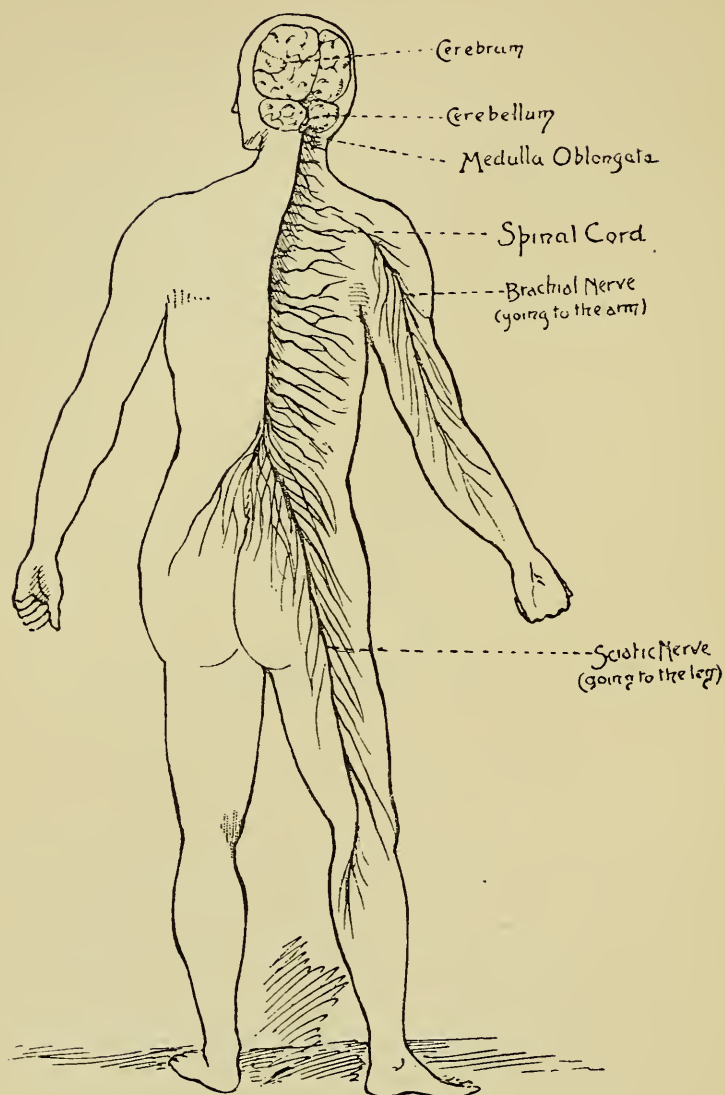


FIG. 11.—DIAGRAMMATIC SKETCH OF THE NERVE SUPPLY.

These nerves, when they leave the cord, divide again and again, and finally end in giving nerve power, or motive force, to the muscles of the body, and, above all, sensitiveness to the skin. No part of the body is supplied with sensory nerves so freely as the skin. It is indeed one vast sensory sheet or network, that envelops so minutely every part of the body, that the finest point of the finest glass cannot pass through without doing injury. When, however, this sensory network is penetrated, a needle even can be thrust into the tissues below without pain.

Before we can understand the action of the spinal cord, it is important to notice, on making a section, that we get an appearance like that in Fig. 10. The dark shading indicates the grey matter of the cord, and is found in its centre. The larger part of this grey matter is in front, and from it pass off the fibres of the anterior root. The smaller part passes into the posterior root. Both unite to form the spinal nerve. When a person performs a movement, say the moving of an arm, the whole of the nervous system is involved. The desire to do so originates in the grey matter of the brain, goes along the white matter through the medulla, down the spinal cord, and passing out at the anterior root of the spinal nerves, passes to the particular muscle which has to perform the desired action. Now we know that the movements of one side of the body are governed by the brain on the opposite side. There must therefore be a crossing at some part. These crossings take place in the medulla oblongata. Paralysis signifies that the connection between the muscle and the brain is severed in some part of the connection, it may be in the nerve, the spinal cord, or in the brain. If the spinal cord be cut or injured, all the muscles below the injury are paralysed. If there is disease in the brain, the whole of the opposite side of the body is disabled and paralysed.

Besides this, however, there is another set of nerves which carry sensation. If we prick a finger with a needle, the sensation passes along a sensory nerve into the cord by the posterior root; it then passes over to the opposite side of the cord, and ascends to the brain. If a sensory nerve is cut, there is loss of all sensation, or *anæsthesia*. If the spinal cord be injured, the body below the point of injury not only loses its power of motion but its sensation as well. The spinal cord is thus a great conductor of impulses to and from the brain—the centre.

DISEASES OF THE NERVOUS SYSTEM

It is beyond the scope of this handbook even to *enumerate* the diseases of the nervous system. The following, however, offered without any classification, are found frequently in Africa, and a description of their symptoms and management, may not be out of place.

Syncope—*fainting—swooning*.—Fainting may be brought about by the want of proper food, or weakness; a copious sudden hæmorrhage (bleeding); or, by sudden loss of the muscular power of the heart. When the last happens, the heart is gorged with blood in all its cavities. The person suddenly becomes pale and giddy, and may fall to the ground unconscious; the breathing may be gasping in its nature, while the eyes stare. If the case is extreme, there is total unconsciousness, the pupils of the eyes become large, while the urine and the fæces may be passed without the sufferer's knowledge; the pulse is weak and irregular; later on there may be vomiting and perspiration.

Treatment.—Place the sufferer in a horizontal position, with the head lower than the body. Remove the clothing from the neck and chest, and allow fresh air to play on the face. If swallowing is impossible, dash a little cold water on the face, and, immediately after, dash a little hot water also; this will set up a reflex action on the heart and lungs and cause the patient to "gasp." Put a little ammonia, or strong vinegar, or pepper to the nose, and rub the hands with a wet cloth. This will usually be enough. If the case still resists, rub the limbs upwards, and give a little brandy or ether by the mouth to stimulate the heart. If, however, it is impossible to get the brandy down the throat, then ether or ammonia, in the proportion of 1 to 5 of pure water, may be injected under the skin. Or give an enema of brandy and water by the bowel. This treatment is to keep the heart from stopping. Nitrite of amyl may be inhaled when the fainting is due to stopping of the heart from excessive heat. It may even be necessary to set up artificial respiration (which see).

Apoplexy (*cerebral hæmorrhage*).—This is due to rupture of a blood-vessel within the substance of the brain, and, as a consequence, more or less tearing of the delicate tissues. The bursting of the vessel may be due to disease in the wall, or to increased pressure of the blood within the vessel. The bleeding inside the brain may be very insignificant, and only push the delicate nerves aside, or it may

lacerate a large portion of the brain tissue. Usually the bleeding is single, but it may be multiple. Should the patient survive, the blood will form a clot, and shrink, and undergo changes.

At times there are impending signs of something being wrong in the brain, as headache, giddiness, mental dulness, or bleeding at the nose. This, however, is not always so. The onset of the disease is always accompanied by an "*apoplectic stroke*," which is characterised by a state of deep sleep, from which the sufferer cannot be roused; he suddenly loses consciousness and falls down; the pulse is low, the breathing long drawn out, and accompanied by snoring; the cheeks are puffed out, the eyelids closed, the eyes, and it may be the head, are turned to the side opposite to the paralysis; the pupils of the eyes, too, are unequal and contracted.

Cerebral hæmorrhage always results in paralysis, which varies greatly. The paralysis is of the opposite side of the body—say a leg and an arm, together with the muscles of the lower part of the face, and often of the muscles which protrude the tongue. Yet the eyes are not involved, as they can be closed together.

The forehead and body are generally bathed in perspiration. At first the temperature falls, and in fatal cases remains low, but almost always in a few hours it rises again. It may reach 107° F. The duration of the stroke lasts from a very few minutes to fourteen days, or even longer. Consciousness may return slowly, but it is seldom that health is perfectly restored.

Treatment.—If there should be any warning, give a very active purge—give, say, 2 drops of croton oil on sugar, and put it far back on the tongue. Leeches may be put behind the ears, the object being to relieve the congested brain. When the shock has come, raise the head, and put ice, if it is to be had, or cold cloths to the head, mustard to the abdomen and calves of the legs. Darken the room, and enjoin that the patient be kept absolutely quiet. Tincture of aconite should be given in 1-drop doses every ten minutes, to reduce the pressure of the blood in the blood-vessels. When consciousness returns, give bromide of potassium in 20-grain doses; above all, avoid stimulants, as they tend to increase the bleeding.

Epilepsy is very common in Africa. It is a disease of the brain, although it is not due to any change that is obvious. There is a temporary loss of consciousness, which sets in with suddenness, and usually with a slight convulsive attack. The sufferer "takes fits." It usually comes on, for the first time, about the age of ten, and lasts till middle life or longer. Intemperance or insanity is frequently in the family, as is ascertained by inquiring after the

family history. Fright, overwork, and great excitement are the usual immediate causes. Usually it comes on periodically at intervals of some weeks, or even months.

Treatment.—Inquire carefully into the family and past history of the sufferer. The best medicinal remedy is bromide of potassium in full doses of 30 grains twice a day. This acts like a charm on the natives. Along with it, however, combine some good tonic, as Easton's syrup. During the fit, loosen all clothing and allow a free play of fresh air.

Convulsions (*seizures*—"fits").—These occur as a symptom of something wrong in quite a number of affections. When called on to see such a case, let the patient be put to bed, with the head and shoulders slightly raised. Remove clothing, and all other constrictions, from the neck. Guard the tongue from being bitten, by placing a pencil or a cork between the teeth. If one seizure after another lays holds of the patient, it may be advisable to give nitrite of amyl, or even in very severe cases a little chloroform. In the case of an adult try and find out the cause and treat it.

CONVULSIONS ARE VERY COMMON IN CHILDREN, and are often due to teething. If the child is about a year old, always examine the gums. Wash the index-finger thoroughly, soak it for a little in 1-40 of carbolic acid, pass it into the mouth, and feel for any raised parts over the line of the gums. If a tooth seems to be near the surface, scrape the spot with the finger-nail; this will set free the troublesome tooth. Rubbing the abdomen for about ten minutes before a fire is good. The best treatment of all is to promptly give a warm bath. Let the water be exactly the temperature of the body when the little one is placed in the bath. Keep the head cool by cold water, and gradually add hot water till the whole is a degree or two above that of the body. Give an enema while the child is still in the bath, and so wash out the bowels. Mustard over the back of the neck is good in every case of convulsions. Some recommend the constant pouring of cold water over the top of the infant's head. Always relieve the bowels either by a brisk purgative as castor oil, or by an enema given in the above way.

Sunstroke—sun - fever — heat - apoplexy.—These are names applied to a class of nervous symptoms which arise from long exposure to the sun or to an artificially high temperature. Of all animals, man possesses the greatest power of adapting himself to changes of climate, and of maintaining health under extremes. He has the inherent power of maintaining and regulating an equable temperature under extreme cold and extreme heat. Strong healthy Europeans can not only tolerate great heat, but thrive in it. The

temperature of the body is practically constant, an equilibrium being maintained between heat formation and heat loss. If by any means more heat is produced than the system can cope with, there is a sudden elevation of the temperature, and the result is sunstroke. Usually the onset is sudden—the patient falling insensible, with gasping respiration, snorting breathing, extreme feebleness of the pulse, and elevation of the temperature. At other times the onset is less abrupt, and comes on like an attack of malarial fever. Here there is weariness, exhaustion, nausea, restlessness, and a high temperature passing on to insensibility.

On careful inquiry into the past history of such cases, it is usually found that for a short period previous to the attack the sufferer has not been well. He has had a shivering fit, and has not perspired regularly, or the ordinary eliminating functions of the bowels, liver, and kidneys have been blocked. He has thus been less able to resist the abnormal state of heat into which he has been suddenly thrown.

All who suffer do not necessarily die ; some recover perfectly ; but many are injured for life, and unfit to return to a hot climate.

Treatment.—Preventive treatment is the best for Africa. Carefully protect the head and spine from the direct rays of the sun by a good thick pith helmet. Light fine woollen clothing should be worn next the body. Take precaution against over-fatigue, physical or mental. Avoid all excess in animal food and stimulants of every kind. Carefully attend to the condition of the bowels, and keep them strictly in accordance with nature. In simple heat-exhaustion, remove the sufferer to a cool place in the shade ; douche cold water on the head and chest ; remove all tight clothing ; apply ammonia to the nostrils, and give a little spirits.

In severe cases where the temperature is from 106° to 109° F., with complete loss of consciousness, stertorous breathing, passing motions in bed, &c., and this serious state lasting for a week or more, the treatment consists in the following : apply ice or cold cloths to the head night and day ; wash out the bowels thoroughly with warm enemata ; give hypodermic injections of ether or quinine ; apply a blister to the nape of the neck ; on recovery of consciousness, order Easton's syrup three times a day as a tonic. No one who has suffered from severe sunstroke should remain in Africa, but should leave it for a cooler climate.

Neuralgia.—This is the term applied to pain originating in the course of a nerve. It usually arises from cold, from injury, from a decayed tooth exposing the nerve, or from pressure on the nerve itself. Often, however, no cause can be discovered. It affects

those who are run down in health, and who are of a nervous or hysterical temperament. The one characteristic feature of neuralgia is an aching, boring, shooting pain, which comes on in marked paroxysms. Sometimes the pain is bearable, at other times it is like to drive the sufferer distracted. It has a tendency to shift about, usually, however, these erratic shiftings are in the course of the one affected nerve.

Neuralgia when it attacks the side of the face is known as *douloureux*. When in the hip it is in the course of the sciatic nerve, and is known as *sciatica*.

Treatment.—Carefully look for the cause and remove it. If the cause is a decayed tooth, as long as that tooth is there, so long will the neuralgia be liable to affect the subject. When the cause of the trouble is removed, attend to the general health. Let the food be abundant and nutritious, and above all, let it contain a large proportion of fatty substances. Apply hot fomentations to the course of the nerve. Friction with camphor, turpentine, belladonna, brandy, and pepper are all good. If these fail, then, in order to relieve the pain, give a hypodermic injection of morphia, or 5 to 10 drops of pure chloroform. These two latter drugs not only palliate but seem to cure the affection.

The following drugs are on the right lines: quinine in 5-grain doses twice a day; antipyrin in 15-grain doses may be taken along with the quinine, and these two together often have a marvellous effect; or begin by taking 10 grains of antipyrin, and in one hour take another equally large dose. One to 5 drops of liquor arsenicalis, or 15 to 20 drops of the tincture of gelsemium is highly spoken of. Exalgine has lately gained a reputation as a cure for neuralgia. It is best tolerated in the following mixture:—

Exalgine	36 grains,
Rectified spirit of wine	4 teaspoonfuls,
Water	6 tablespoonfuls.

Of this take a table spoonful in water every second or third hour.

The new drug apolysine is highly spoken of in the treatment of neuralgia. The pain is said to disappear rapidly after one application.

Sciatica merits a word further. It is one of the most common forms of neuralgia. Here, however, the pain is really constant, with severer paroxysms supervening. These have been described as “lightning” pains darting from the hip to the toes. It is usually confined to one leg, but in severe cases it radiates to the other. The causes of this trying affection are exposure to cold, weakness of

nutrition, and exhaustion. It is a debility of the nervous system. In some cases great fæcal accumulations in the lower bowel bring on the disease and keep it up.

Treatment.—All sorts of drugs have been tried, internally and externally. Electricity and galvanism alone, or combined with Turkish baths, and massage are excellent. Very chronic cases seem to have been successfully treated by the deep injection of a 1 per cent. solution of osmic acid. The best of all treatment seems to be absolute rest, with a blister applied to the course of the nerve every week, and the deep injection into the tissues of morphia, say $\frac{1}{4}$ grain, or cocaine, $\frac{1}{4}$ to $\frac{1}{2}$ grain.

Headache—sick headache—migraine—megrim.—These are names given to a peculiar form of headache which is very common in Africa, as well as other places, and which has the peculiar tendency of coming on in paroxysms. It affects the system first about the age of puberty, and may continue for years. It seems to be hereditary, being handed down from one generation to another. The causes are too numerous to mention, but mental worry seems to be the leading cause. The attack may come on suddenly, but usually it is insidious, creeping on the system with slow step. At first the sufferer may feel an uneasiness about the stomach, then a gradual feeling of pain in the head. Meantime the eyes become heavy, the face flushed, and the temples throb. In some cases, however, the subject becomes extremely pale ; in others the illness is ushered in with slight shivering, and it may be vomiting. In the majority of cases the attack will go off in about twenty-four hours, but it may hang about the system for four days or a week. As a rule it does not affect those who are well advanced in life.

Treatment.—This resolves itself into the management of the attack, and in the employment of such measures as will prevent its return. When the headache is at its worst it is useless to fight against it : the sufferer must give up all physical and mental work. Long walks in the open air should be undertaken if the sun is not too hot, or he should go off and have a chat with a friend. Of all drugs, antipyrin, or antifebrine, or phenacetin, and this class of remedies, are the best. In some cases they act like magic. As soon as the attack begins to make its appearance let the sufferer take of antipyrin or phenacetin 10 or 15 grains. If the pain does not go in a quarter of an hour or less, then the patient should rest on a sofa and take half of the above dose every hour for four consecutive hours. Persons suffering from fever or from this nervous affection can take larger doses of the drug than those who are in perfect health. If the patient has reason to fear the drug,

then he should take 3 or 4 grains every twenty minutes till relief comes. Every individual must find out what exactly is the dose of any drug which his constitution requires in order to be brought under the physiological action of the same. Constitutions differ in this respect. The doses given in every case are only approximate: in one case it may be a very little less, in another case it may be a very little more. The salicylate of soda gives relief in a few cases if it is taken in 20-grain doses.

The following is antipyrin combined with quinine, which is an excellent mode of giving the drug:—

Phenazone (Antipyrine) . . .	10 grains,
Citrate of caffein . . .	4 „
Quininæ hydrobrom . . .	4 „

Let this be made into two powders, and let one be taken every two hours. It is almost certain to remove the nervous headache.

Sleeplessness or insomnia.—Sleeplessness is very common in Africa, and manifests itself very often as the first symptom of fever. It is due, often, to the presence of malarial fever, to over-exhaustion, to congestive conditions of the brain, to certain drinks injuriously affecting the brain, such as alcohol, tea, coffee, and tobacco. Sleeplessness is also one of the first signs of a breakdown of the constitution.

Treatment.—Try to find out the cause. Thus, in some, the drinking of strong tea at a late hour of the night is the cause of hours of restless tossing. This being found out must be avoided. A late supper affects some. Late mental work affects others. Before resorting to drugs it is always wise to confine the management to strict attention to the laws of health. This may be the first call of injured nature. Make the diet plain but nutritious; take gentle open-air exercise; avoid mental work and worry of all kinds. Cold feet must be warmed and rubbed till they tingle. Before retiring it is wise to bathe the feet in warm water, drying them well with a coarse towel. Cold-water bandages may be applied to the head, but should never be allowed to give discomfort. Make the body as comfortable as possible under the blankets, endeavour to lie absolutely still, taking long drawn-out breaths, till one hundred has been counted. Very often before fifteen or twenty-five have been reached one or two moments of unconsciousness have intervened. Hot-water bottles to the feet and abdomen prolong the dilatation of the blood-vessels, drawing blood from the brain, and refreshing sleep supervenes. Narcotic medicines should be avoided as long as possible, although it is better to have recourse to them than to pass

a sleepless night and to face a day of worry and work. In all cases they should only be resorted to as a temporary measure.

In mild cases of sleeplessness, after a day of marching in the sun or great mental work or worry, the least harmful narcotics are the bromides of potassium and sodium. Take 30 to 45 grains of the former in 4 tablespoonfuls or more of water. Repeat the dose in an hour or so. The bromides may be taken for many nights in succession without injury to the system.

Chloral has been extensively used as a sleep-inducer. It is perhaps the best we have when there is no pain present. The dose is 30 grains.

Sulphonal is excellent as a drug for producing sleep. It acts well when no pain is present. It is colourless, odourless, tasteless, and insoluble, and the dose is from 30 to 45 grains. It is also excellent in preventing the night sweats which are so distressing to the wakeful in the hot season. Dissolve it in boiling water—say half a cup—and drink half-an-hour before lying down.

There are new drugs highly spoken of, as paraldehyde, urethane hypnone, but these should only be given by the physician.

Where sleeplessness is due to actual pain the best way is to give a hypodermic injection of $\frac{1}{4}$ grain of morphia.

Alcoholism (*chronic alcoholism*).—This affection is really a toxic disease of the nervous system. Alcohol, if taken to excess, acts as an active poison, and if pushed will destroy life. When it is taken in quantity and constantly repeated, it brings about a class of symptoms which are known by the above names. In some cases the body becomes emaciated, in others there is obesity. The features in time become red, flabby, and “pimpled.” The white parts of the eyes become bloodshot. The appetite for food is in abeyance, especially in the morning, and there is in the mouth a troublesome regurgitation of sour fluid. The tongue is coated with a thick fur, and the breath is foetid.

The nervous system is markedly affected, as is manifested by morning tremblings of the hands on the performance of any delicate manipulation. There is loss of memory and judgment, indicating an impairment of the intellectual powers. The “will” to do anything is weak. The emotions are susceptible, so that the sufferer cries or laughs without apparent reason. Headache and swimming of the head are complained of. It may be sleep is broken, and unpleasant dreams rob the still hours of night of their repose. Later on in the affection, ordinary duties are neglected, and the conversation becomes rambling and incoherent. On the other hand, some subjects of chronic alcoholism manifest a peculiarly

suave and unctuous manner. There is a marked perversion of the "moral" sense, in that the subject of the disease, being ashamed of the weakness, seeks to screen himself often behind a lie. Later on there is indifference to all family ties, and, it may be, deception and lying of the meanest kind are resorted to. The "man" is unmanned. Everything in life is subservient to this one unnatural craving—alcoholic drink.

The liver, kidneys, and nervous system are structurally changed. The sufferer has what is known as the drunkard's liver—a shrunken dried-up apology for the real organ.

Delirium tremens (*acute alcoholism*).—This disease is the result of long-continued drinking to excess, together with the neglect of the bodily frame. It is due to acute alcoholic poisoning, and is characterised by delirium, sleeplessness, and muscular tremors. It is not the result of one or two "bouts" of drink, but is the direct result of long-continued indulgence. For days or weeks before the attack, the person is irritable, uneasy, unable to sleep at night, and readily loses power over himself. He goes from his food, being unable to eat. To get relief, as he fancies, he resorts to the one thing that is slowly undermining the system—alcoholic drink.

Suddenly he becomes more wakeful than ever, and is seized with an uncontrollable trembling. The mind becomes confused and excited. He is talkative, and, it may be, furious. He sees animals, monsters, and devils in his near neighbourhood, grinning at him, and mocking his misery. Or, it may be, he fancies that he is pursued and must make his escape. He becomes suspicious of those who are around him, being sure that they are the cause of his distress. He has delusions of every sense, which occasion him the acutest pain; these delusions taking the hideous form, or that of some unpleasant emotion. Some who suffer from this disease become wildly maniacal, and attempt all sorts of mad things; others are sullen, sour, and gloomy. Usually in the midst of all this mental aberration the afflicted one can be recalled temporarily to himself. Thus, when his physician, or one whose voice he is in the habit of obeying, speaks imperatively, he has moments of lucidity. Usually, on the least attempt at movement, there is a violent shaking of the limbs, upper and lower. The temperature is not much affected, but the face is red and flushed; the tongue is furred and the breath foetid. There is an inordinate craving for something to drink, and a distaste of all nutritious foods, while all the ordinary calls of nature are in abeyance. The brain is congested to irritation, and is cedematous.

This wild state may last from three to ten days, during which time sleep has been quite absent. At last sleep supervenes, and from this he wakes up somewhat like the old "self," but utterly exhausted.

Treatment.—Every form of spirits must be absolutely forbidden. This must be enjoined should force even be necessary. Liquid foods, such as beef-tea, should be given in teaspoonfuls. Insist on a brisk purgative being taken, such as 5 grains of calomel and 15 of jalap. Sometimes the hypodermic injection of morphia acts admirably. Bromide of potassium in large doses (say 30 to 45 grains) acts well in such cases. The drink craving is relieved by strychnine given by the mouth or hypodermically. Liquor strychninæ in 5 to 10 drop doses in water is the usual form in which it is given. The sufferer must be nursed, and watched night and day. No mechanical restraint should be resorted to, but he should be carefully tended and coaxed. If there is very great excitement, give a wet-sheet pack, which will act quickly and calm the overtaxed nervous system. When the attack is over, perfect quiet and calm must be enjoined, and tonics of quinine and iron given for some months.

Concussion—collapse—shock.—These three terms relate to a functional depression of the system. It is a shock given to the heart or to the brain which markedly depresses the vital powers. It may be due to a poison, a fall, the receipt of bad news, excessive pain, or other like causes.

The symptoms are first of all a fall of the bodily heat; the lips become pale, the body cold and clammy; the pulse is small and feeble; there may be hiccough and nausea, dimness of sight, or like symptoms.

Treatment.—Lay the person down in a horizontal position, and apply blankets and hot-water bottles to the extremities. Gently rub the body so as to restore animation. Give a little brandy punch if the sufferer can swallow. Apply mustard in the form of poultice to the nape of the neck, spine, and calves of the legs. In alarming cases give a weak solution of ammonia or sal volatile under the skin.

Insensibility, or stupor, or coma.—These terms express degrees of incapacity, and may be due to a great variety of causes. If the stupor is due to poisoning, as say from opium, then empty the stomach by some means. Put the finger into the back of the throat, or use a stomach-pump. Give a cup of very strong coffee, shake the man well, and force him to walk about the room. Then give a brisk purge, say one drop of croton oil. This can do no harm. Apply mustard to the neck and warmth to the body.

Insanity, dementia, mania, melancholia, monomania are all terms which indicate a certain departure from the normal mental state. Such cases are rather common amongst the natives, and mental worry may bring on a like state amongst Europeans. The treatment must resolve itself into careful nursing and watching of the sufferer. If possible let the surroundings be changed. Attend to the general health by means of good tonics, cod-liver oil, &c. Insure that good sleep is obtained. As regards drugs, hyoscine stands highest ($\frac{1}{150}$ grain of the pure drug being given hypodermically). Sulphonal is excellent.



CHAPTER VII

SPECIFIC FEVERS

Fever is characterised by undue elevation of temperature. The average temperature of the human body is 98.4° F. (36.8° C.), and in health varies little from this. In fever the state of equilibrium is disturbed, and the temperature falls or rises. It may be as low as 95° F., which would be looked upon as a collapse temperature, and it may be as high as 110° F. The production of heat is due wholly to the oxidation of the tissues of the body and the food, which takes place during every form of bodily activity. Heat is, on the other hand, being constantly given off by the lungs and excreta of the body, and above all by the skin. The temperature of the body represents the balance between these two. Both of these are under nervous control, and are constantly being brought into relation one with the other by the circulation of the blood. In the state of fever this balance is lost, and oxidation runs wild. The increased heat, or the loss of heat, is perfectly evident to the hand when laid on the skin of the sufferer. It can only, however, be correctly estimated by the thermometer. (*See How to take the Temperature*, p. 173.) Besides the change in the temperature of the body, there are other evidences of fever. The skin is dry and parched, and it may be rough to the touch (goose-skin), or bathed in perspiration. Headache is usually complained of. There is a sensation as of breaking asunder in the small of the back. There is sleeplessness, and it may be delirium. This change from the normal, usually sets in with a severe shivering fit, which is due to a spasmodic contraction of the blood-vessels in the skin. The pulse and the breathing are similarly affected, and are much more frequent than the normal. There may also be a bad taste in the mouth, loss of appetite, nausea, and vomiting. The urine is scanty, high in colour, and very acid.

All the specific fevers are due to low forms of microscopic life setting up chemical or fermentative changes in the blood.

The blood.—In order to understand fever it is absolutely

necessary to know a few things as to the nature and functions of blood. The blood is a red fluid, which fills, during life, the arteries and veins and capillaries of the body. It is the nutritive fluid of the tissues and the great carrying tissue of the body—a means of exchange within the system. Its functions are complex. It conveys food materials to every tissue, it removes thence all waste products, and its red corpuscles carry oxygen. The blood in the arteries going to the tissues is bright red in colour, whereas the blood coming from the tissues in the veins is of a dark hue. The red corpuscles have great powers of absorbing oxygen, due to the presence in them of a colouring matter known as the hæmoglobin. This substance, which is one of the most complex in the body, carries oxygen from the lungs in a loose form, and supplies it to the body tissues.

The circulation of the blood is well seen in the tail of the tadpole. The following sketch (Fig. 12) represents what is seen when the tip of the tail is put under a low power. Only the smaller vessels are seen. In the larger vessels the blood is going with such rapidity, that whilst you see that there is motion, you do not see the individual corpuscles of the blood. In the smaller vessels towards the outer sides the circulation is clearly seen: a single corpuscle may be sometimes observed winding its circuitous way through the vessel: in others the corpuscles may be seen to be moving backwards and forwards in a trembling manner; in others again they appear to be stagnant and to cleave together. The fluid part of the blood is straw-coloured.

If a little bit of the foregoing is put under a higher power an appearance like that of Fig. 13 will be seen. The vessels, it will be observed, are filled with a thickish-looking fluid. There are very many red blood corpuscles to be seen rolling along, as in the diagram. These corpuscles are very elastic, and change their shape, so as to move through a very narrow vessel. They seem to be somewhat spindle-shaped in the tadpole. They often go through vessels singly. The white blood corpuscles are also distinctly seen. They seem to be sticky, and do not go as fast as the red. Many seem to stop, and stick to the wall of the vessel. They often quake, as if shaken by the fluid in which they float, but do not wave back and forward as the red corpuscles do, when in a vessel through which there is no current.

When the blood alone is examined, it is seen to consist of an almost colourless fluid, the plasma. This fluid is very complex, but has a permanently fluid portion—the serum—and a portion which goes to form the clot of the blood. In the plasma there are an innumerable number of two kinds of blood corpuscles, the red

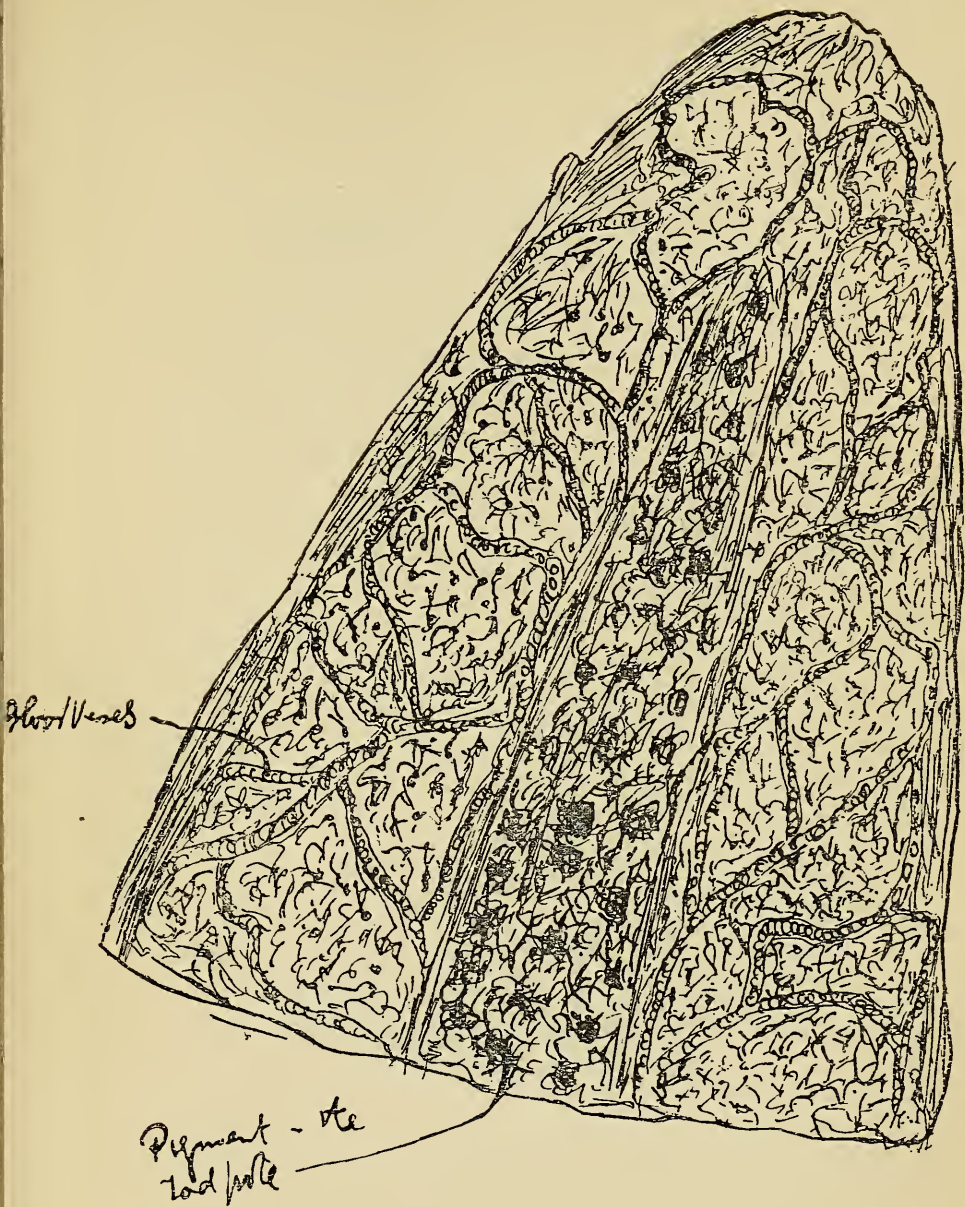


FIG. 12.—THE CIRCULATION OF THE BLOOD IN THE TAIL OF THE
TADPOLE, SEEN UNDER THE LOW POWER.

(Drawn from life.)

and the white. The red are by far the more numerous, being estimated at one white to 355 red. (See Fig. 14.)

It is estimated that, in a healthy person, about 5,000,000 of red corpuscles are found in one small drop of blood. The individual

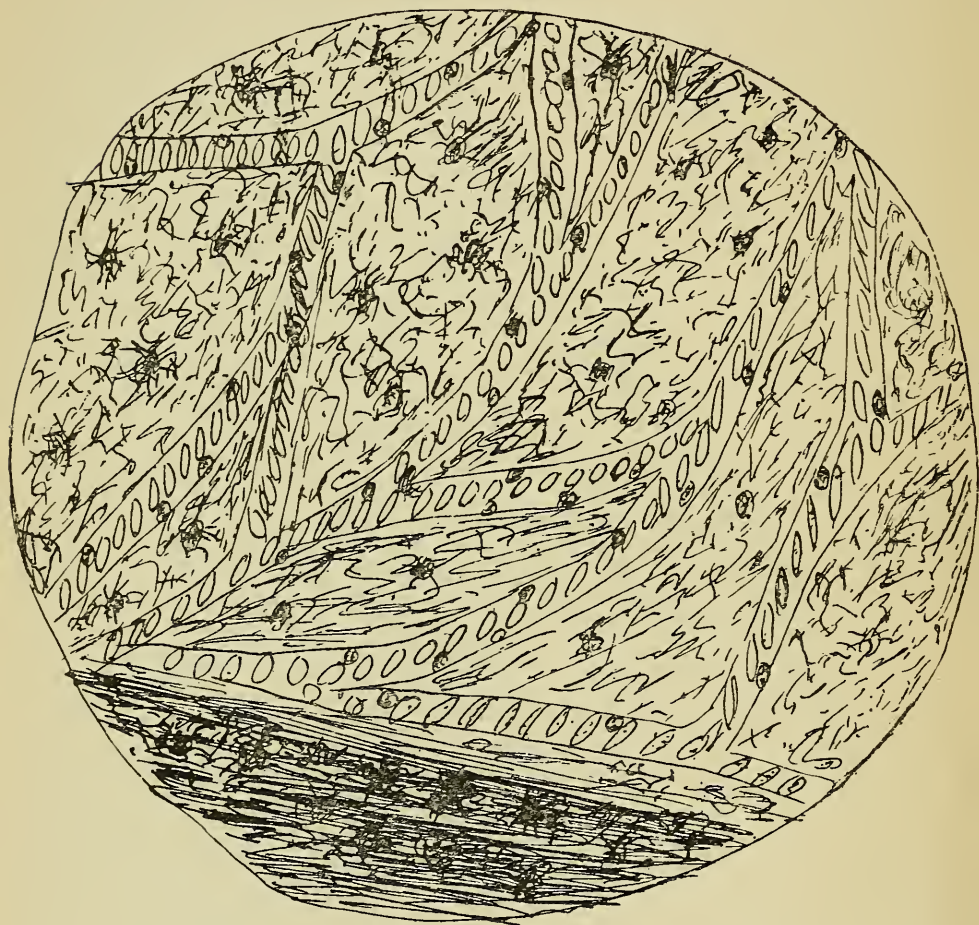


FIG. 13.—A PIECE OF THE TADPOLE'S TAIL SEEN UNDER THE HIGH POWER.

(Drawn from life.)

corpuscle is not red, but more of a pale straw colour; when in bulk, however, they look red. They are composed of a colourless membrane and a coloured fluid, the hæmoglobin. On being

withdrawn from the body they tend to run into heaps, like a pile of coppers or *rouleaux*. Then the white blood corpuscles or phagocytes are larger than the red, and consist of a jelly-like substance which is sticky. In common with all one-celled bodies, they possess the power of altering their shape, that is to say, they can put out a little process of their body and pull themselves along. This is known as the amoeboid action. By this means the white blood corpuscles eat up everything injurious that is found in the blood. They also have the power of wandering outside the

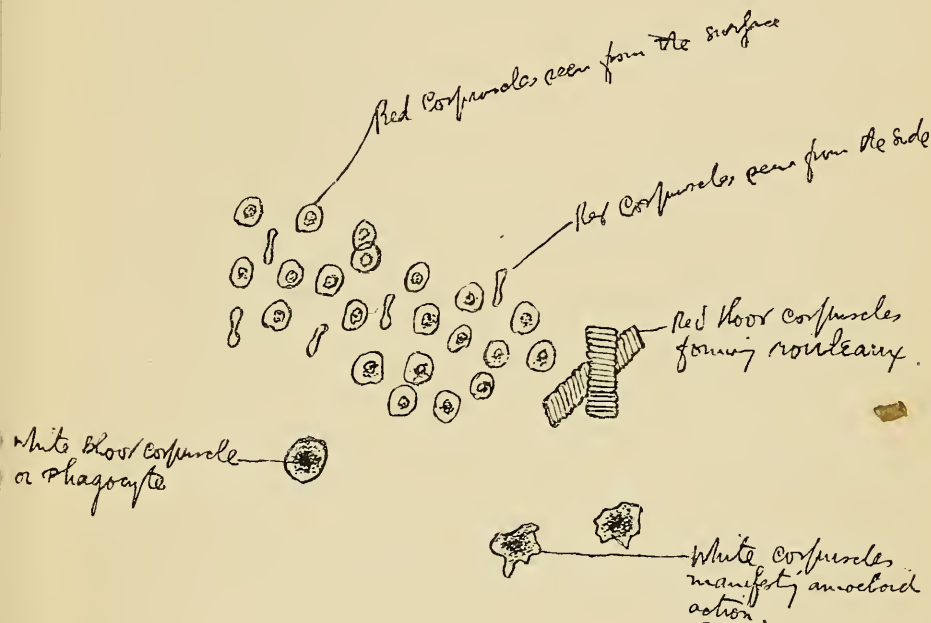


FIG. 14.—BLOOD CORPUSCLES FROM THE HUMAN SUBJECT.

very small blood-vessels (capillaries) into the tissues. They are the scavengers or soldiers of the system, and with their own bodies are able to repair all breaches of the tissues. They are wonderful bodies these little phagocytes. When an injury is received, say a cut, these cells appear in great numbers, surrounding the breach, infiltrating the tissues, proliferating rapidly, adhering together, and undergoing changes into connective tissue, until a scar is the result and the breach healed. If the injury should be severe or prolonged, then in the struggle many of them lose their lives, being destroyed by the poisonous secretions of enemies (bacteria),

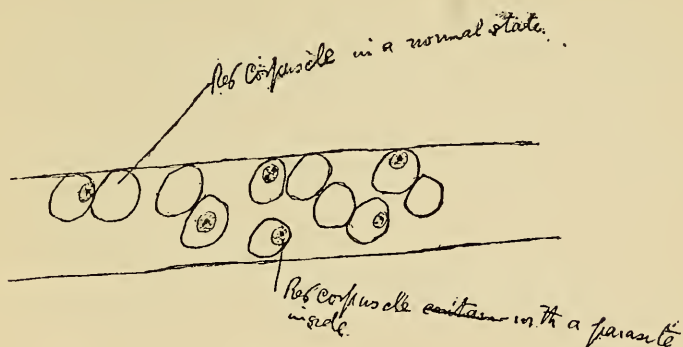
and the outcome is pus. If the blood is threatened by the presence of injurious particles, such as vermilion or carbon, or the malarial parasite, then the phagocytes lay hold of these, living or dead, and literally eat them up, digesting them, and converting them into soluble substances, to be secreted by the skin or liver or kidneys.

Malarial fever.—No disease is so universally distributed as malarial fever. (In Africa it is always spoken of distinctively as “fever.”) It is found in all continents. Owing to the cultivation of the soil, drainage, &c., it is seldom seen in Europe, or only seen in its milder forms. It was only in 1880 that the true nature of this disease was demonstrated. Almost all fevers are due to living organisms attacking the system and going through a life history. No infectious disease arises of itself any more than a crop of wheat springs up spontaneously in the farmer’s field. All come from seed, and all have been sown in a soil that has suited their peculiarities. The parasite of malarial fever is believed to be a low form of fungus which attacks the red blood corpuscles, consuming them, and so destroying that on which our very life depends. The parasite lives in the interior of the red corpuscle, and absorbing the hæmoglobin, converts it into a black substance named melanin.

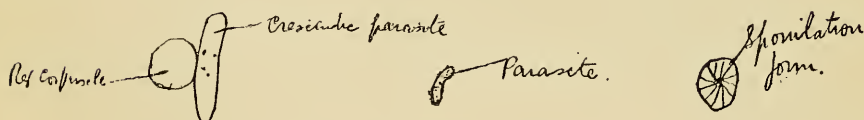
It has for ages been known that ordinary malarial fever renewed itself in twenty-four, or thirty-six, or forty-eight hours, and so on. It is now known that the attack of fever coincides with the bursting and setting free of a crop of these microscopic parasites; and the time the parasite takes to go through its life cycle determines the type of fever. It is clear that if this should go on uninterruptedly, these enemies would destroy every red corpuscle in the body, and the result would be anæmia, weakness, and death. We have, however, a means of defence. Whenever fever is set up in the system the white blood corpuscles or phagocytes seem to be quickened into activity. They become excitedly active. Assisted by a number of giant white corpuscles (macrocytes), they, like a body of impassioned soldiers, rush upon the parasitic intruders. Both combatants are amoeboid in their action, but the phagocytes are the larger of the two. By their stickiness they attach the intruders to their bodies, absorb and digest them, so that all that remains of the parasites is the black colouring-matter. This dark matter is named melanin, and is the hæmoglobin of the destroyed red blood corpuscles. It is unexpelled faecal matter. The phagocytes carry this melanin to the liver, kidneys, bowels, and in some cases malarial sores.

This process, phagocytosis as it is called, has one of its most

important seats in the capillaries of the liver: the relatively large size of the blood-vessels there and the slow current, afford a specially good opportunity for this action taking place. Moreover, some assert that the inner membrane of the capillary blood-vessels (endo-



CAPILLARY BLOOD-VESSEL CONTAINING RED BLOOD CORPUSCLES
AND MALARIAL PARASITES.



CRESCENTIC FORM OF PARASITES.



WHITE BLOOD CORPUSCLES CONTAINING BLACK COLOURING MATTER.

FIG. 15.

thelium) has also the power of engulfing parasitic intruders and their toxic poison.

A typical attack of fever.—After a person, coming direct from Europe, has been exposed, in a malarial country, for from seven to twenty-one days, his system having imbibed the poison, a marked series of phenomena are brought into play. For a short period

previous to the actual attack he is elated, peculiarly bright, and cheerful. Then he becomes dogmatic in his manner, boisterous, and perhaps irritable. At a variable hour he is conscious of a feeling of cold creeping over his frame, which may begin in the fingers, toes, or legs. He creeps near the fire or walks in the sun, feels gruesome and shivers. The teeth chatter, and like one stricken he lies down and covers himself. There is sickness, the head aches, and the small of the back is like to break. Feeling very thirsty, he drinks. He craves for blankets and hot bottles. In an hour or two the sufferer is conscious of flashes of heat darting through him. Gradually he ceases to shiver, and the face becomes red and flushed. The pulse bounds. He may begin to mutter and sing. In young people at this stage there may be convulsions. The nose may bleed. The veins on the forehead become prominent. If the temperature is taken, it will be found to be 103° or even 105° F.

This stage may last for four or six hours, when gradually another change sets in. Beads of perspiration appear on the forehead and temples, and in an hour the body may be bathed in moisture. Gradually the temperature falls, the pulse becomes soft, the head is relieved, and altogether he is calmer and better. Sleep may supervene, and in an hour he wakes—the fever gone.

The three stages—cold, hot, sweating—here referred to vary greatly in different cases: one or other may be absent or greatly exaggerated.

In twenty-four, or forty-eight, or seventy-two hours, almost to a minute, there are signs of the return of the above great disturbances of the normal state. Again there is the cold, the hot, and the perspiring phenomena. This is typical intermittent fever. These forms of ague, returning with remarkable regularity, are found in the south of Europe, and in the less malarial countries; where the severer forms of malarial poisoning are found, as in the centre of Africa, the fever may not relax its hold of the system for many days. It has also been observed that in those who are strong, and who have come into a malarial country for the first time, the above stages are well marked. The cold stage is severe, the headache intense, the tendency to delirium apparent, and there is bilious vomiting. On the other hand, in those who have been long exposed to the malarial poison, the cold stage is not so marked, nor is perspiration so profuse. There is giddiness, stupor, weakness, and the fever does not tend to abate for many days.

In the present state of our knowledge, it is impossible to give

a complete list of the various forms of malarial fever, they are so numerous, and apparently so different.

The following classification may assist :—

- (1) FORMS OF MALARIAL FEVER WITHOUT MARKED FEVER, OR APYREXIAL FORMS.
- (2) FORMS THAT RELAX THE FEVER AT INTERVALS, OR INTERMITTENT FORMS.
- (3) FORMS THAT RELAX FOR A LITTLE, BUT DO NOT ABATE ALTOGETHER, OR REMITTENT FORMS.

I. APYREXIAL FORMS OF MALARIAL FEVER.

Fever, in the sense of having an increased bodily temperature, accelerated pulse, thirst, and headache is not an absolutely essential accompaniment of malarial poisoning. The poison may be in the system, and do its deteriorating work, without bringing about actual fever. The following are forms of this :—

Malarial diarrhœa.—Here, instead of an ordinary attack of fever, there is severe diarrhœa. It is a flow, and is attended with little or no pain. It produces a sense of relief rather than of suffering. Before it sets in the patient feels as if he were about to have an ordinary attack of fever. There is tenderness in the spleen and liver, indicating that these organs are congested. The ejecta are bilious. In a couple of days the sufferer feels weak, as if he had suffered from fever. It may be that the temperature has been a little above the normal. Here the usual dose of quinine acts as it would in fever. The poison has been thrown off by the congested bowel.

Malarial dysentery.—General experience shows that where malaria is intense there is an absence of dysentery. This disease is looked upon in its ordinary form as being due to a specific virus. In the affection before us we have not regular dysentery, but a dysenteric form of malarial fever. The fever poison has attacked the mucous membrane of the lower bowel, and brought on an affection which simulates true dysentery. The stools are dark and fluid, with some mucus. Here ipecacuanha has little influence, but quinine and perchloride of iron have a very marked effect.

Malarial ulcers.—These appear in some persons as *crops of unhealthy looking monstrous papules* which come to their maturity in four or five days, form pus of a thin watery nature, dry up, and pass off. Some of the papules have a hard base, and when they disappear leave a dark stain behind. They are seen chiefly on the lower limbs and hips. Another class appears as *angry-looking, punched-out, irritable ulcers, half an inch in diameter*. They are seen usually in the neigh-

bourhood of the ankles, and are constantly giving off unhealthy matter. They appear first as a crop of papules, but gradually one of them takes upon itself a vigorous growth while the others pass away. It may be that this form of ulcer has started in a mosquito bite or other light abrasion. The sore may exist for many months. *A third class appears as sores as big as the palm of the hand, and always on the lower limbs.* All who suffer from these fever-ulcers assert that, when the sores are open, no fever is present, and when there is typical fever in the system no ulcers are to be seen. Should the ulcers close, the sufferer in a few weeks becomes feverish. The ulcers on closing leave the skin deeply stained a dark brown colour. This dark colouring-matter is related to the melanin of the white blood corpuscles.

The following may be classified here. A young man, A. B., had only been in Africa for a few weeks; when he accidentally injured his knee. The joint became extremely swollen and painful. He had no fever, but paroxysms of pain in this one joint. He tried all kinds of treatment with little apparent effect. After five weeks he tried quinine locally, and internally, with very marked effect. The joint perspired, and to his astonishment the pain and swelling abated. In after years when he had an attack of fever he felt the old pain and uneasiness in his knee.

Malarial paleness.—I have seen several cases of this. After a number of regular attacks of fever the sufferer develops very great anæmia of the body. Pains are felt in the back and limbs, the spleen is enlarged, and there is much neuralgia. The blood on being examined is watery, while the face and feet are dropsical. The nose, gums, lungs, stomach, and bowels may bleed. There is no regular attack of fever, but the system is intoxicated by the malarial poison.

Malarial headache, neuralgia, and other nervous disorders.—These come on instead of an attack of fever. They are periodic in their occurrence. The headaches, sciatica, and neuralgia are very characteristic, and lead us to think that the nervous system is not well nourished. They respond to quinine and antipyrin drugs.

Metastatic forms of fever.—Sometimes in the course of ordinary fever the disease seems to change its seat. Thus, suddenly, without any warning, the testicle becomes violently inflamed, or if the sufferer is a female, the ovaries or the mammary glands are inflamed and painful. When this takes place the regular attack seems to be cut short. I have known of several cases of this kind. When in a feverish state the patient has been injudicious in exposing himself, with the result that there has been a marked change of the seat of the disease.

II. FORMS WHICH RELAX THE FEVER AT INTERVALS, OR INTERMITTENT FORMS.

There are three classical forms of intermittent fever which have been long known. They are the quotidian, the tertian, and the quartan. Here we have outbursts of fever at definite intervals. (See Fig. 16.)

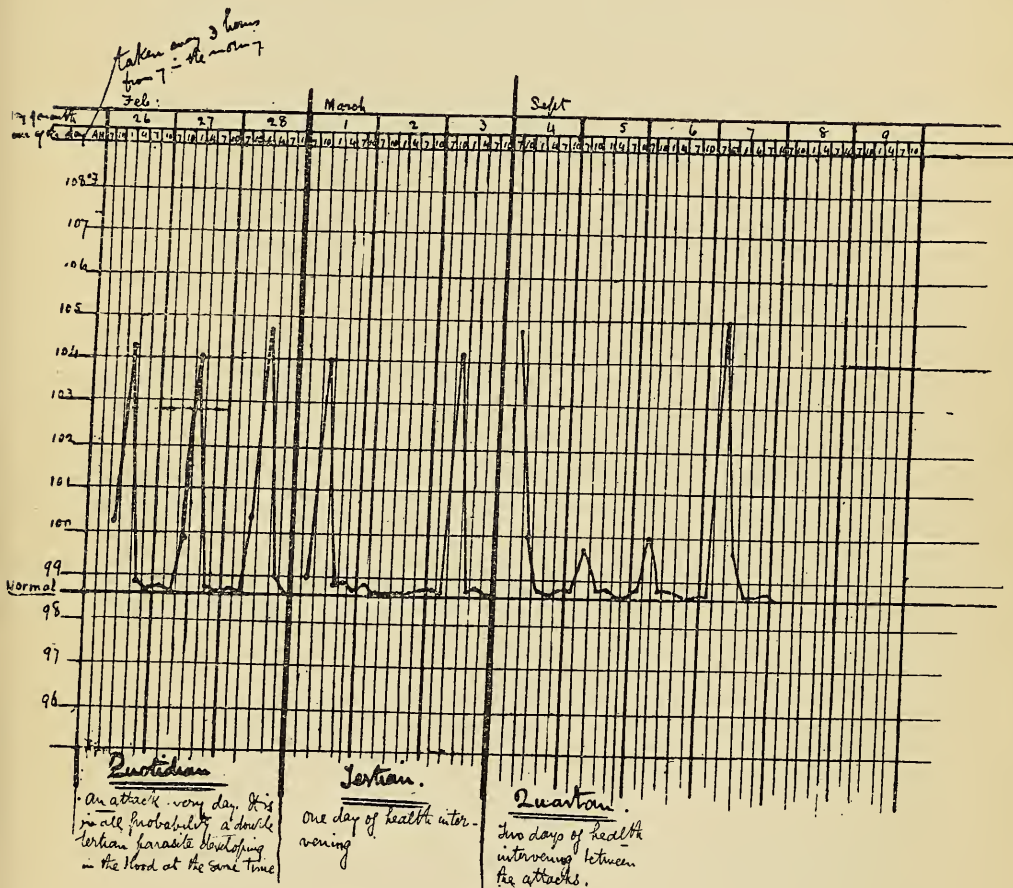


FIG. 16.—TYPICAL TEMPERATURE CHARTS OF THE THREE REGULAR FORMS OF MALARIAL FEVER. (Taken from cases in the country.)

If the above chart is studied these forms of fever will be clearly understood. The chart shows that the temperature has been taken carefully every three hours. In the *quotidian* the outburst of fever takes place every twenty-four hours. In the *tertian* the out-

burst takes place every second day. In the *quartan* the outburst takes place every third day. These three types seem to be well marked in temperate regions or where the malaria is less virulent, but they are not so well defined in Africa. All varieties of irregular types appear there.

To each of these varieties of fever a special form of parasite belongs, which keen observers can define. It is also well known that there may be two sets of parasites running their courses in the weakened system at the same time. This has been made out especially in the case of tertian fever, and it has been shown that they reached their sporulation periods on different days. We have thus not a quotidian fever, but what is known as a double-tertian. Practitioners in the tropics lay it down as a maxim, that, when the temperature runs up, on consecutive periods, at an hour later than the last paroxysm, the fever is on the decrease, and conversely, when the fever rises at an hour earlier than the last appearance, the fever is on the increase. This serves to confirm the idea of a parasite of increasing and declining virulence.

The following forms of fever are intermittent, but, during the course of the fever, a something steps in and gives the case a serious turn. The sufferer becomes delirious, or is convulsed, or becomes unconscious. The following types have been seen :—

Intermittent with delirium.—Some sufferers are delirious during every attack of fever. The patient sings, and talks, and mutters, tossing the head from side to side. This matters very little, however : even boisterous delirium, occurring at the height of fever, is not very serious. Should, however, the delirium not pass off with the onset of perspiration and fall of temperature, it is apt to develop into complete insensibility or coma.

Intermittent with convulsions.—Here there are violent and involuntary contractions of the muscles of the body, with alternate relaxations. Usually the sufferer feels excessively sleepy. These attacks pass away readily, but come again when the fever is high. They are most common in young people.

Intermittent with complete insensibility.—It is when the fever is at its height that insensibility sets in. When the perspiration has continued for some time, and the temperature begun to fall, these symptoms may pass off. On the other hand they may continue for days. The patient is so drowsy that he cannot be roused : he snores, his eyes are open, and the pupils dilated.

Intermittent with excessive shivering.—Here the cold stage is exaggerated ; or suddenly, when the perspiration is expected to break out on the forehead, the pulse becomes so very rapid that

it can with difficulty be felt. The legs become cold, the lips white, the eyes glassy and sunken, the bridge of the nose hollow and pinched, and the patient shivers most violently. The cold is only apparent, for the thermometer in the axilla registers 103° F., or even higher. This may last for hours or days, although clothes are multiplied and hot bottles applied to every part of the body.

Intermittent with biliousness.—This form is very common in Africa. There is usually a prolonged cold stage; then very excessive vomiting of bilious matter. The sufferer has an agonising pain in the pit of the stomach, and it may be suffers from hic-cough; there may also be spasms of the leg muscles—cramps indeed. There is usually great looseness of the bowels, little secretion of urine, and a kind of collapse. Altogether the symptoms are like those of cholera.

Intermittent with fainting.—Every attack of fever is accompanied by a tendency to faint. Faintness is also a sequelæ of fever. It may accompany all the forms of fever, but is most common where the cold stage is exaggerated. If the patient suddenly turns in bed, or jumps up to stool, all around may become dark, or he may fall like a log.

III. FORMS WHICH RELAX IN VIOLENCE FOR A LITTLE, BUT DO NOT RELAX ALTOGETHER, OR REMITTENT FORMS.

Here the fever suffers a decided remission of its violence during the twenty-four hours, but does not entirely abate. The patient feels better, but on taking the temperature it is found to be above the normal.

Fig. 17 is a chart of typical remittent fever.

Mild remittent.—In this form we usually get a warning of its approach. For a day or two before the onset of the actual attack there is a feeling of weariness. The cold stage is not marked, being short and in some cases hardly perceptible. The patient fights against the fever, but is at last forced to go to bed. The temperature ranges from 102° to 105° F. There is retching and vomiting. In a few hours free perspiration sets in, and the temperature may go down to 101° F., but does not reach the normal. It is, when examined carefully, seen to be an abortive perspiration. This variation from cold to heat may go on for a week or more, the patient being unable, as it were, to shake off the fever. Careful observation will reveal the fact that the rise of the temperature, and the feeling of cold, appear at a definite hour each day, or the fever may slip over a day

and return in two days. There are many sweating periods, but no typical perspiration. Everything seems abortive. Jaundice seldom appears in the ordinary mild remittent, but it may be present in a slight degree. At last, after a week or more, there is a sudden rise

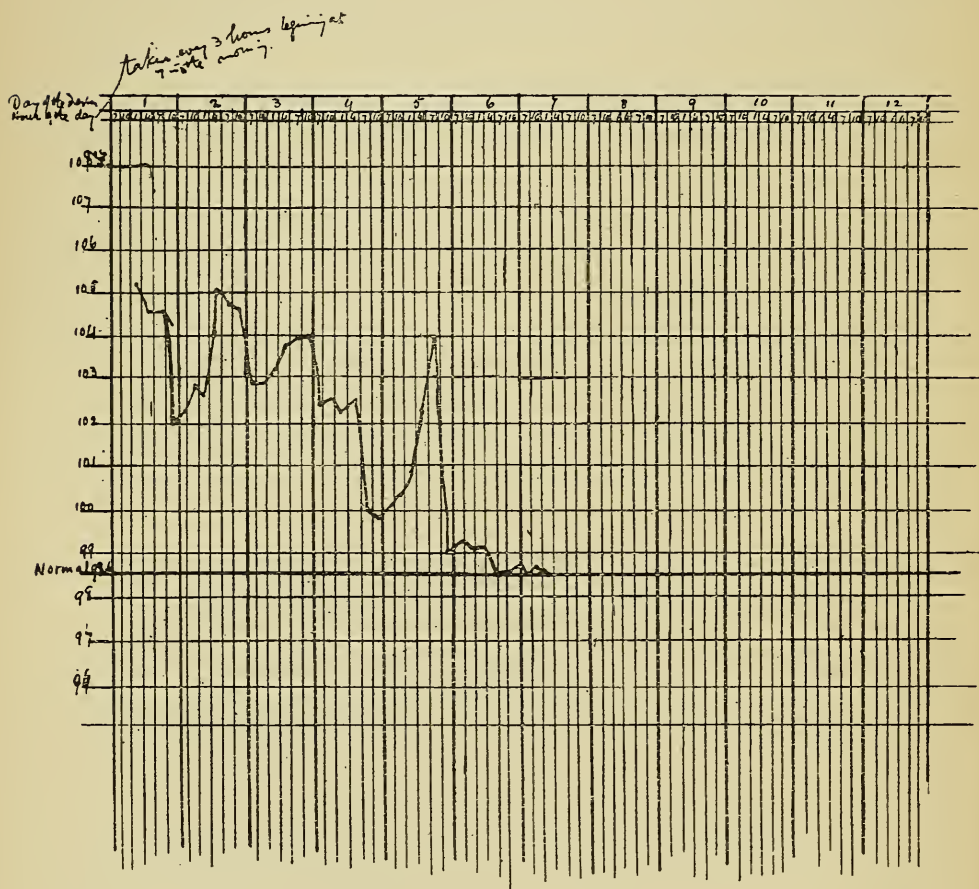


FIG. 17.—TYPICAL REMITTENT FEVER. (Gastric form.)

of the temperature, a copious perspiration breaks out all over the body, and on taking the temperature it is found at last to be normal.

Gastric remittent.—This is the form which attacks most newcomers to Africa. It begins, in the usual way, after a variable period of exposure, with headache, shivering, burning skin, &c. The face is red, and the bowels are constipated. The vomited matter is a

watery fluid which may contain bile; the urine, however, is not bilious. The sufferer may be slightly delirious; he may rave about guns and shooting, and often be most desirous to see his guns. Having recently come to the country and been occupied in shooting, the mind seems to take this bent.

Bilious remittent.—This form is much the same as the above, only very early in the attack the patient begins to vomit dark green bilious matter. The bowels are loose and the stools bilious. Jaundice may be observed in the white of the eye. There may be bile and albumen in the urine. Bile seems to be generated in excess owing to the wholesale destruction of the red blood corpuscles, and nature by every channel is doing her best to cast out the injurious thing. Vomiting may take place every half hour till the patient is completely exhausted. The temperature is usually 103° F. or more, and may run up to this point, or to a higher, every second day. In other cases the symptoms may disappear after four or five days' illness. Suddenly, however, there is a relapse, and the worst symptoms return with renewed vigour. There may be bleeding from the nose, and the legs may swell. Mentally too the sufferer is stupid and dull, and he may even sink into a comatose state. His one cry is "water," and his one complaint "want of sleep." The remarkable feature in this form of fever is the extraordinary secretion of bile, and the marked efforts of the system to throw the bile off. Bile is excreted by the urine, the bowels, the stomach, and even by the skin. There is an abnormally abundant supply of bile, the tissues even, it would seem, taking on this function, as the whole body becomes suddenly yellow. Some hold that the malarial poison (whatever it exactly is) gives rise to a toxic substance which destroys the corpuscles. It is well to know that the skin, when it is yellow from biliary obstruction, is itchy, but when yellow from causes other than biliary obstruction, as in this form of fever, is not at all affected.

Cerebral remittent.—The one characteristic of this form is the affection of the brain, manifested by delirium and convulsions, or it may be by a comatose state with deep snoring. It usually has the symptoms of the above bilious form, but on the third or fourth day insensibility sets in, or half the face may be paralysed. There may be distressing hiccough. Every motion may be passed in bed. Complete collapse may take place through failure of the heart. It is always serious if the delirium continues while the temperature is falling.

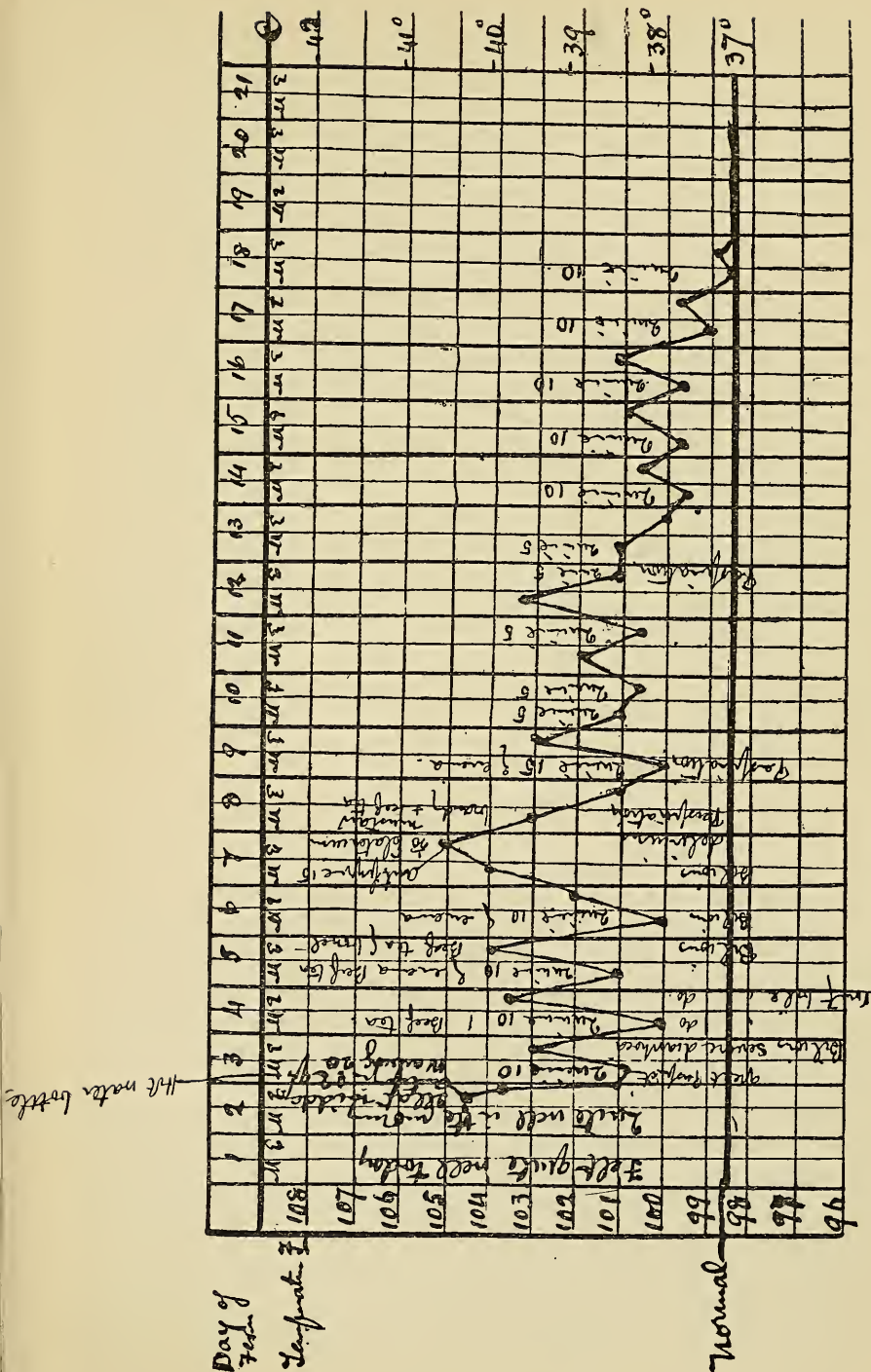
Algic remittent.—Here, in addition to the above symptoms, while the body temperature is still very high the legs and arms

become cold, and a clammy sweat breaks out over the whole body. The urine may suddenly stop. The patient may be unable to speak although conscious.

Typhoid remittent.—Here, in addition to continued high fever, bilious vomiting, &c., in about a week or less the pulse becomes weak and thready. The sufferer is torpid and cannot be roused, and mutters as he tosses his head from side to side. The tongue becomes dry and black, owing to the absence of saliva. The teeth and gums are covered with a foul whitish stuff. The skin is yellow, and dry and parched. The bowels are bound. The temperature varies greatly from near the normal to 106° F. (*See Fig. 18.*)

Black-water fever, or bilious hæmoglobinuria.—This begins as a regular remittent fever. There is severe vomiting of bilious matter, which may take place every half hour, night and day. There are bilious stools, marked jaundice, and delirium. Sometimes there is a free discharge of black urine, or it may be of actual blood. Towards the close of a fatal case there may be suppression of urine, resulting in coma and convulsions. Everything in this affection points to the wholesale destruction of the red blood corpuscles, and to a desperate effort of nature to throw the resulting irritant off. The patient vomits, purges, sweats, and in some cases bleeds. There may be bleeding from the mouth and nose, and even from certain purple spots on the skin. As in yellow fever there may be a bleeding from the mucous membrane of the stomach and bowels, which, acted on by the digestive fluids, may lead to a black vomit. This, however, is not general. A frequently marked feature is, that the attacks are *paroxysmal*. They come on with a shivering fit, severe pains in the back, retention of the testis, vomiting, and lowered temperature. Two hours after, when the urine is passed, it is dark red, contains albumen, and deposits a sediment. I have heard of a case where the paroxysm came on every time the hands were placed in cold water. The dark urine may continue to be passed for three or four days; in other cases after a few hours there is a return to the normal state. I have had a case in whom these seizures returned every morning about eight o'clock for ten days in succession. Gradually they diminished in severity and passed off. Between the attacks the urine seemed perfectly normal. The patient recovered.

There is another form where we get actual blood in the urine. Here the urine is like porter, the blood being intimately intermixed with the urinary secretion. We infer in such a case that the kidneys are highly congested, and that there has been actual bleeding in the urinary tract. I have known of one case in which the urine was passed in long streaks of coagulated blood.



Then we may get actual suppression of urine. We know that this occurs in the course of other fevers in Europe, as for instance scarlet fever. It is also the case in some forms of cholera, and in severe shock to the system. In all febrile affections the secretion of urine is scanty. Actual suppression leads on to uræmic poisoning, which manifests itself in headache, nausea, vomiting, motes dancing before the eyes, an ammoniacal breath, and convulsions. The patient may fall down insensible, while the muscles of the face twitch. He may foam at the mouth and bite the tongue. No urine being passed, the products of waste and change are retained in the blood.

These forms of black-water fever have been proved to be associated, in many cases, with the malarial parasite, but not in every case, so that the consensus of opinion is that it is due to malaria, *plus* something else. It is now known that hæmoglobinuria may arise apart from malaria. It is found in the blood of yellow-fever patients, where it is also due to the destruction of the red blood corpuscles. Glycerine given in large doses dissolves the hæmoglobin, and allows it to float in the blood. From the remarkable tendency hæmoglobinuria manifests to come on in paroxysms, and from the suddenness with which it ceases, we infer that the explanation is to be found in the study of the neurotic supply of the kidney. Women and weakly persons are seldom affected. It seems to be confined to young healthy individuals, in whom there is great muscular waste.

SEQUELÆ OF FEVER.

The following are some of the after consequences of malarial fever :—

Anæmia.—Extreme pallor of the lips and face is an invariable accompaniment of fever. Instead of there being 5,000,000 of red blood corpuscles to the drop of blood, there may be 1,000,000, and this, over the body, means an immense loss. Often too the corpuscles that remain are larger or smaller than normal. After bilious remittent fever the patient is very pale.

Dropsy of the feet and body.—This is always the case when there has been great destruction of the corpuscles. The constitution of the blood is altered, in that it is more watery, and the capillaries, not being nourished, allow the watery constituents to transude into the tissues.

Brick-red deposit in the urine.—It is a common observation that the urine of some, who have suffered from fever, leaves a brick-red sediment on the bottom or side of the urinary vessel. Here

the red blood corpuscles are not only fewer in number, but the colouring-matter separates from the stroma as a red deposit. Could we peep into the liver, spleen, and kidneys, we would see this red substance in their tissues.

Chronic affection of the liver and spleen.—After several attacks of fever, these organs, in certain constitutions, become dull and heavy. The spleen may be enormously enlarged. This, however, is no sign of danger. Some think it is a good sign. Native children, in malarial countries, suffer from great enlargement of the spleen.

Forms of paralysis.—Complete and partial paralysis, together with loss of the sense of pain, have been recorded. Strange to say, too, these abnormalities are often located to certain districts or islands. On the island of Likoma, Lake Nyasa, British Central Africa, there have occurred, within the last few years, several cases. They appeared in those who had been for a short time in the country (all less than a year), and after several attacks of regular intermittent fever. They affected the lower limbs only, one having complete paralysis of the legs together with anæsthesia. A second had a little feeling in the limbs, but complete paralysis. A third was able to walk a little, dragging one leg after another, but there was total loss of all sensations in both legs below the knee.

Cases of paralysis of one side of the face have been noticed. In the morning the sufferer could not close the right eye and could not whistle. The tissues were described as being "stiff." This inconvenience went off in a couple of weeks. Temporary want of speech is known.

Affections of vision.—It is a common observation in those who have had much fever, that, when they have been in the recumbent position and have suddenly assumed the erect posture, that, for a few seconds, they partially lost the power of vision—everything seemed dark, or motes danced before the eyes. This is due to the anæmia and debility affecting the retina. Several cases of complete blindness, which lasted for weeks, have occurred on Lake Tanganyika, and one case to my knowledge on Lake Nyasa. Some suffer from flashes of light in the eyes, or it may be circles dance about the eyes, or yellow circles are seen at the side.

Perversions of smell and taste.—These senses are often affected. Soup taken at dinner tastes like gooseberries, or another is constantly troubled with bad odours.

Blood affections.—Very often during the course of a severe fever the blood seems to be changed in such a way that it does not coagulate in a normal fashion. Here we say that the fibrin of the

blood is lessened. I have known of a patient who, after a severe attack of fever, plucked off unwittingly, while falling asleep, a small pimple on the face. Bleeding ensued of a serious nature. Some hours after, he awoke to find the pillow covered with blood, and the bleeding as active as ever. Pressure was applied for hours before the blood coagulated and the bleeding came to an end.

Deposits of colouring matter.—The blood pigment from the destroyed red blood corpuscles is regularly deposited in the different tissues of the system. The spleen and liver are darker in colour than normal, and the skin of those who have suffered from malarial fever has a clayey dirty palor. The scars from malarial ulcers are always markedly dark in colour.

Perversion of the heat-regulating mechanism.—We are told that the mechanism which regulates the heat of the body is referred to three centres in the brain. There is—

(1) *A heat-producing centre.*—This centre in the brain may be affected by bleeding into its substance, or by poisonous drugs acting on it, or the toxine of fever may irritate it, and the result is a rise of temperature. The source of heat in the body is the consumption of muscular tissue.

(2) *A heat-losing centre.*—This regulates the breathing organs, the blood-vessels of the skin (which embraces an enormous area), and the sweat glands.

(3) *A heat-regulating centre.*—This keeps the balance between the two former. In every healthy person this centre regulates the whole mechanism, and only allows a range of about 1° F. in the day. The body of a healthy person may be exposed to a temperature much below zero, or to a heat much above the normal bodily state, and yet the actual temperature of the body remains the same. If, however, this heat-regulating mechanism is disorganised, it is most difficult for its influence to be renewed. In malarial fever we are forced to think that this has taken place, and the higher controlling influences are impaired.

Every one who has been in malarial Africa knows how very easily fever is brought about. A slight exposure to the sun, some indiscretion in eating—and the result is fever. For years after the individual has removed from all malarial influences and resided in Europe the result is the same. There a catarrhal cold ends in fever. A long cold railway journey brings on all the phenomena of fever. Once an old African got his leg broken, and the shock brought on apparently regular malarial fever. In Africa it is the common experience that the excitement of receiving a mail from home brings on fever. When those resident in the country are

writing despatches they frequently do so with a temperature ranging from 102° to 105° F., nay, frequently on such occasions the brain is peculiarly active. We explain these phenomena by saying that the heat-regulating centre has been upset by the malarial poison, and every deviation from the normal state takes the form of a high temperature. Nor is this adjustment of the heat-regulating centre easily restored. For years after—say from four to seven—the system, although we may say it is free from malarial fever, has the tendency, whenever it is upset, to revert to the old course—shivering and perspiration. Such is not *malarial fever*, but the *malarial habit*.

It is impossible to enumerate all the sequelæ of fever. Some suffer from intermittent attacks of neuralgia of the face and eyes. Some suffer from toothache; others from numbness of the limbs, like a false paralysis. Some have no feeling in toes or fingers; others are martyrs to sciatica, for the malarial influence is mostly spent on the nervous system. Some suffer from palpitation, from asthma, from indigestion, from bronchitis, &c. These all affect those who are anæmic, and whose health has been reduced by fever.

The mind naturally asks for an explanation of these various and extraordinary phenomena, and we can only answer in part. The *plasmodium malarie*, found in the blood, spleen, liver, &c., are looked upon as the immediate cause. Whether, however, they themselves are the cause, or the toxines which they generate in the blood, it is impossible meantime to determine. Why in some cases the fever should be of the anæmic form, or the ulcerous, or the orthodox oscillation of temperature, can only be partially guessed at. The occurrence of the paroxysm of fever, at definite periods in the twenty-four hours, is probably synchronous with the escape of the spores. The sudden rise of the temperature is due to increased oxidation, and also to a lessened loss of heat, caused by the contraction of the cutaneous arteries. It is a common observation that whilst the body heat is much above the normal at the beginning of the hot stage, the extremities are cold and pale. The abnormally high temperatures that are sometimes met with, may be caused by the irritant in the blood so affecting the heat regulating centres of the brain, that oxidation runs wild. The feeling of a warm glow passing over the body, and the onset of perspiration, is probably due to the relaxation of the arterial spasm. The nervous phenomena, such as headache, are probably due to the blood coursing in the brain with greater force than usual, and also to the presence of the parasite irritating the brain tissues. Then the increase in the colouring-matter of the urine is due to the fact

that the watery constituents pass off by the skin, while the solid constituents are retained.

Within the last few months "Dr. Manson has revived the mosquito theory of the spread of malaria. This theory, which was at one time suggested by Laveran, is no other than that the mosquito sucks the blood of tropical residents, and the corpuscles containing the plasmodium are withdrawn in the process, and gain entrance to the stomach of the mosquito.

"The plasmodium, being contained in a corpuscle, is protected from phagocytes while in the human blood; but whilst protecting it, the parasite, being inter-corpuscular, cannot develop, and it is only by gaining the stomach of the mosquito, and there being exposed to the action of digestive fluids, that it can get rid of its sheath and become free. At the same time that it becomes free the parasite, which while intra-corpuscular was motionless, now develops 'flagellæ,' by which it is endowed with motion. The power of movement enables it to escape from the digestive juices of the mosquito's stomach and bury itself in the tissues of the mosquito's body. There it will remain possibly in a quiescent state until the death of its host, when it will be deposited in or on the water or the swamp which the animal haunts. From water to the human body is an easy step, and in this way is the cycle kept up."—*Medical Annual*, 1897, p. 390.

TREATMENT OF MALARIAL FEVER.

Every form of life has enemies. In the struggle for existence which has been going on during the ages, every living thing has developed within itself some antitoxine which gives it the power of defence against enemies. Neither man nor beast, reptile nor fowl, insect nor plant, escapes from the ravages of lower pestilential forms of life. What, however, seems to be poison to one has little effect on another. When the rinderpest scourged Africa the ox and the buffalo and certain forms of antelope were stricken down in vast numbers, but sheep and goats were proof against the poison. They had a power within themselves which rendered them immune against that which destroyed the more powerful oxen. Similarly, man sought a weapon of defence against his malarial enemy. That he found in quinine. Quinine is an alkaloid derived from certain plants which have an immunity from malarial poison. These plants belong to a certain genus of the order Cinchonaceæ, are evergreen, and flourish in those regions where malaria abounds. For long quinine has been known as a medicine of great value in

the cure of ague, and diseases attended with feeble debility. The oil of eucalyptus trees is of the same nature. Quinine possesses great power over low forms of life. One grain dissolved in one ounce of water (two tablespoonfuls) will kill instantly all infusoria and fungi, while two grains prevents alcoholic fermentation and stops putrefactive decomposition, thus acting like an antiseptic. This is the secret of the action of quinine in all intermittent forms of fever. It is possible that it prevents the growth of the *plasmodium malariae* in the blood. It too has some power over the movement of the white blood corpuscles. The *sulphate of quinine* is the preparation that is most frequently used. It is sparingly soluble in water (1 in 700 parts). In alcohol or dilute sulphuric acid it is very soluble. The hydrochlorate of quinine is much more soluble, dissolving in 1 to 34 of water. Locally applied, a dilute solution, say 4 grains to the 2 tablespoonfuls of water, has a germicidal, antiputrefactive, and antifermentative action. It is a marked antipyretic and antiperiodic. It is also a preventative medicine in those who are exposed to the risks of malarial poison. It should be taken with this object in view, in 2-grain doses, every night and morning. The tannate of quinine, being tasteless, is excellent for children, and should be given in milk, in from 1 to 4-grain doses.

Quinine has a direct action on the parasite of malaria. Laveran, in 1881, said that "it is because it destroys the parasite that quinine causes the disappearance of the manifestations of paludism." He showed that when $\frac{1}{10,000}$ solution of quinine was allowed to run under the cover-glass, the movements of the parasite were instantly arrested. This sums up the results of almost every observer. On the other hand, most agree that the crescentic bodies which appear in the more dangerous continued fevers, are affected slowly, if at all, by quinine. (See Fig. 15.)

Golgi, in his paper of 1892, asserts that quinine in tertian and quartan fevers acts most markedly on the young free spores, less markedly on the more advanced forms, where the red blood corpuscles are almost disintegrated, and least upon the young endoglobular forms. We say, therefore, that if quinine be given freely several hours before a paroxysm occurs, it will not prevent segmentation, but it will destroy the new group of parasites. The segmentation takes place, and the toxic substances are generated, resulting in the chill, but this latter is modified, and, it may be, retarded. Furthermore development of this group of organisms is made impossible.

The best time, then, to push quinine, and to have the system

thoroughly under the influence of the drug, is two or three hours before the paroxysm of fever is expected, though continued doses, three times a day, may be absolutely necessary to wholly eradicate the parasite and its resultant toxic poison. Quinine best combats the development of the parasite when it is in solution in the blood at the time the spores are being set free, that is, some hours before the onset of the fever.

There is, however, a percentage of persons who cannot take quinine. In some it seriously irritates the stomach, and may lead to depression; in others it acts violently on the nervous system, causing dizziness and stupor. It may bring on skin eruptions, swelling of the face, irritation of the bladder and kidneys, and other disagreeable effects. Let such persons take one or two tabloids of $\frac{1}{50}$ of a grain each of arsenic, or, every three hours, ten drops of Fowler's solution (a preparation of arsenic, also named liquor arsenicalis), gradually increasing the dose. Always take arsenic after a meal, and with a good drink of water.

TREATMENT OF APYREXIAL FORMS OF FEVER.

Malarial diarrhœa.—Do not stop the diarrhœa unless it is excessive, say over eight stools per day, and lasts for a long time. The diarrhœa is analogous to perspiration. Take 5 grains quinine twice every day. Apply a warm poultice over the whole abdomen, and take complete rest. Let the food be unirritating to the bowel, such as boiled milk, beef-tea, and corn-flour. Should the diarrhœa be excessive, give an enema of thin starch, and 30 drops of laudanum twice a day, together with dilute sulphuric acid (10 drops) twice a day in a glass of water. In such cases it is important at stool not to use paper. Let the anus be washed after every motion with cold water, and mopped with a linen rag.

Malarial dysentery.—Neither is it wise to stop this. The ailment is a part of the fever, not a complication, and nature is curing herself. Instead of giving ipecacuanha, give small doses of quinine, say 3 grains three times a day, and 30 drops of the perchloride of iron freely diluted in water at the same rate. Easton's syrup (1 teaspoonful in water thrice daily) acts admirably in such cases. Let the strength be kept up by fluid nourishment. Eight drops of liquor strychninæ in water, three times a day, is excellent as a tonic.

Malarial ulcers.—These are allied to the above forms, and should not be too readily closed. Those who suffer testify that,



when the ulcers close, feverish symptoms, as languor, disinclination for work, manifest themselves. Let the ulcerous limb be rested, elevated, and dressed with the following: carbolic acid, 1 part; iodoform, 2 parts; olive oil, 4 parts. Wash and dress night and morning. Let quinine be taken in its tonic forms, 1 grain three times a day.

It is important that the large sores be well bound with linen bandages, or, better still, be well supported by an elastic bandage. Let this bandage be kept absolutely clean, and let it be applied before rising in the morning, and taken off before retiring at night. When these ulcers heal, they always leave a marked brown stain. This is due to the deposit of blood pigment, and is an exaggerated form of the dusky pallor of the skin peculiar to all who have suffered much from malaria.

Malarial paleness—Cachexia.—What is needed here is a change to a healthier locality, or, better still, a long sea voyage. Even the natives in Africa are alive to the benefit of a change from one locality to another. Easton's syrup in 1-teaspoonful doses, three times a day, is excellent. Blaud's pills too (4 three times a day), act admirably. The tonic compounds of Burroughs, Wellcome & Co. are good.

Headaches, &c.—Take 10 grains of quinine and 15 grains phenacetin. This, in my experience, acts like magic.

In the treatment of enlarged spleen, the result of infection from malaria, the following is excellent:—

Hydrochlorate of quinine	.	.	30 grains,
Tincture of quassia	.	.	1 teaspoonful,
Tincture of chinchona	.	.	1 „
Water	.	.	10 tablespoonfuls.

Let two tablespoonfuls be taken every day before the evening meal.

When the spleen has been enlarged for a long period, and is hard to the touch, it is well to take, every day, 15 grains of the iodide of potassium. Others again recommend that daily the patient should strip, and have about 40 tumblers (or about one gallon) of cold water poured over the region of the enlarged organ, from the distance of one foot in height. Thereafter the region of the spleen, and the whole abdomen, should be vigorously rubbed by rough warm towels, for at least five minutes. (*See Enlargement of the spleen*, p. 40.)

TREATMENT OF THE INTERMITTENT FORMS OF FEVER—
ORDINARY FEVER.

Whenever fever manifests itself with coldness and shivering, remove the ordinary wearing apparel as speedily as possible, and go to bed. Put on several pairs of extra blankets; put hot-water bottles to the feet, abdomen, and back; and under the clothes briskly rub the legs upwards, from the ankle to the knee. Warm drinks, such as tea, are good, but the inordinate craving for liquids should not be satisfied. If the patient can keep it down, give 10 grains Dover's powder, and in order to the retention he should lie absolutely still. If liquid is taken sparingly he is not so likely to vomit. If the headache is very severe, give 15 grains phenacetin, and it will be relieved. In a variable period perspiration will appear on the forehead, and soon diffuse itself all over the body. In some hours' time the load of blankets, which was so agreeable at the beginning of the attack, will be a burden. Before removing them, however, give the sufferer 5 grains quinine, and having fresh clothing laid out, speedily remove the wet garments, rubbing the body with a rough towel. Thereafter give 5 grains of quinine every three hours, until 20 grains have been taken in the day. Small doses, often administered, are more effectual at this stage than one large dose.

Should the vomiting be severe it may demand treatment.—In such a case put a mustard poultice over the stomach, and keep it there for half-an-hour. If the sufferer is an adult, and the poultice is not sufficient to allay the vomiting, let 30 drops of laudanum, in some liquid starch, be thrown into the rectum, as an enema. If vomiting still persists, give sulphate of morphia, $\frac{1}{2}$ grain, hypodermically (1 grain morphia is contained in 10 grains powdered opium). *Never give opiates to children.* Give ice to suck if it is to be had. If not, prepare lemon drinks (*see* p. 194). Lemons are found in most parts of Africa. The juice of the lemon, citric acid, and tartaric acid are identical in action, and are most grateful refrigerants. The gases of effervescing drinks soothe the inflamed inner coat of the stomach, and hasten the perspiration. When the patient has perspired freely, it often gives relief to sponge the body with cool water, or vinegar and water, bathing the limbs one by one.

Let it be a rule, that, if the patient is attacked with fever shortly after a meal, and the stomach is loaded with food, the treatment be begun by giving an emetic. Thirty grains of sulphate of zinc or 10 grains of sulphate of copper, in a tumblerful of tepid water are good. Apomorphine, $\frac{1}{10}$ grain injected hypodermically, acts with certainty and rapidity, especially when the patient is unable to

swallow. Mustard in dessert-spoonful doses, in large quantities of tepid water, is very effective. Tickling the back of the throat by the finger or a feather, is a good method. Emptying the stomach freely will relieve the nausea and painful retching.

I wish to say a good word on behalf of Warburg's tincture. It is not at all a scientific mixture, and savours of the old nostrums, when a dozen drugs were thrown into the compound under the belief that one surely would be effectual. Still, in fever, it has an influence not easily explained. My experience is, that if a person should feel languid, dull, sickish, disinclined for work, as though fever were hanging about the system, and should take a full dose of this tincture and rest in bed, in all probability the fever will be thrown off. It acts markedly on the bowels, and seems to cut short an ordinary attack of fever. Messrs. Burroughs, Wellcome and Co. supply this drug, admirably done up in tabloids, six of which are a dose. In using the drug always take the full dose of six tabloids, with a draught of water.

As a medicine for mitigating fever, the tincture of aconite is superior to Warburg's tincture. Of this drug use 1 drop every ten minutes for an hour, then repeat the dose every hour till the skin acts well and the temperature is reduced.

The headache can be relieved by cloths wrung out of cold water, laid on the temples. Fifteen grains of antipyrin given by the mouth, or larger doses given by the rectum, act admirably. This drug also reduces the temperature. For my own part I prefer phenacetin to antifebrine or antipyrin: it has been given daily in quantities of from 15 to 30 grains for months, in all forms of pain with success, and without injurious effect. It influences favourably every form of fever, keeps down the temperature for four or five hours, and brings on a profuse perspiration. Children bear antipyrine well if given in three grain doses every two hours.

General experience shows that if the bowels have been freely opened, during the course of the fever, quinine acts quickly and powerfully. It is, therefore, good treatment to give a Seidlitz powder when the sufferer calls loudly for something to drink. In all the grave forms of fever, as convulsions, or delirium, give at once 5 grains of calomel and 15 grains powdered jalap. This is specially good when there is bilious vomiting and bilious stools. The calomel acts on the liver, and assists nature to throw off the injurious thing.

Sleeplessness is often distressing and calls for treatment. (See Article on Sleeplessness.) There is no drug better than sulphonal for the sleeplessness of fever. It is one of the most valuable of the

recent additions to medicine. It is colourless, odourless, tasteless, and insoluble; it is a pure hypnotic, and has no bad effects in ordinary doses. It is, however, slow in its action. Dissolve 40 grains in a little hot water one hour before sleep is desired, and let it be taken when little fluid is on the stomach. It acts admirably when sprinkled on bread, or in weak soup, or other warm beverage. It is the best soporific in 7-grain doses for children.

If *delirium and low muttering* is present in the course of a fever it need cause little anxiety. Put cold cloths on the head, and sponge the body with vinegar and tepid water, exposing one limb only at a time.

If *severe convulsions*, together with other cerebral symptoms, set in, put the patient in a warm bath at the same temperature as the body, and put cold cloths on the head; then gradually add cold water to the bath, and thus reduce the temperature. (*See Bathing*, p. 182.) If you suspect the bowels of being loaded, give while in the bath an enema of warm water and so relieve them. The same treatment applies to a child. Children take convulsive fits much more frequently than grown-up persons. If the stomach of the child is full, give as much Dover's powder as will lie on a threepenny piece. This will relieve the stomach. Then put 2 grains of calomel on the tongue, or while the little one is still in the bath give a warm enema. It is important to relieve the bowels.

If *there is complete insensibility with snoring and dilated pupils*, and you ascertain it is not due to alcohol, opium, or injury, then you must conclude that there is some pressure on the brain. If the face is red and flushed, and the arteries of the head throb, give 5 grains calomel and 15 grains jalap if he can swallow, if not put 2 or 3 drops of croton oil on the back of the tongue. Raise the head, and put powdered ice on it, if it is to be had. Put mustard poultices on the legs and arms so as to draw blood from the brain.

Shivering is sometimes distressing, and may be a serious menace to life. In such a case get blankets and hot bottles, with all possible haste, and put the system under the influence of quinine as speedily as possible. Give 20 grains by the mouth if it can be swallowed; or give 10 grains by the bowel dissolved in thin gruel or starch. The most speedy means of bringing the system under quinine is by giving it hypodermically. The acid hydrochlorate is the most soluble form of the drug, and dissolves in its own weight of water. If this is not to be had, the ordinary sulphate will melt, by adding half its weight of tartaric acid dissolved in water, or indeed a few drops of any acid. If the case is grave, inject into the skin in all about 10 grains of quinine. In giving a hypodermic

injection select the skin over the outer part of the arm (not the inside), rub the part briskly with a towel, pinch it up firmly, and insert the needle. Little pain will be felt, as by this means you partially anæsthetise the skin, and the tissues below have very little sensory development. Be sure that the needle enters well into the tissues and not into the skin only.

The following is an admirable means of giving quinine to children. Dissolve 2 grains in thin starch or cod liver oil and inject into the bowel ; or take of the flaky sulphate of quinine (not tabloids) about 3 grains, lay it on the palm of the left hand, pour a few drops of olive or cod liver oil over the drug and rub briskly over the abdomen of the child for half-an-hour. A not inconsiderable amount of quinine will be absorbed by this means. Children bear quinine wonderfully well. The tannate of quinine is a white insoluble powder which is almost tasteless, and given in milk is excellent for children. For a child give 2 grains three times a day.

Hiccough is often distressing and demands treatment. All sorts of medicines have been tried for it. What I have found most effective is not a drug, but the setting up of other reflexes, say by giving very strong snuff, which brings about violent sneezing.

Where the temperature is very high, say above 105° F., the following is most useful :—

Salicylate of soda	30 grains,
Antipyrin.	30 „
Simple syrup	2 tablespoonfuls,
Water	6 „

Of the above give for an adult a tablespoonful every hour. For young people about twelve, give a dessert-spoonful, and for children of three, give a teaspoonful every hour.

TREATMENT OF THE REMITTENT FORMS OF FEVER.

As this form of fever begins in the usual way with shivering, the same treatment must be pursued as in the less serious intermittent, namely, blankets, hot-water bottles, drugs, &c. In most cases the remittent seems to be an abortive form of intermittent. We, therefore, as soon as perspiration makes its appearance, push quinine in the usual way. Small doses, say 5 grains, every three hours, are more effectual than one large dose. It is noticed that those who suffer from the mild remittent forms of fever, are apt to have a relapse every seven, or fourteen, or twenty-one days.

Special care should be taken on these days, and an extra dose of quinine superadded. Every form of remittent fever has periods in its course when the fever abates a little and some perspiration appears. When we notice that these remissions are regular, it is good to give, during the remissions, two doses of quinine, say of 5 grains each. Give the first of these as soon as the fever falls, and the perspiration appears on the brow. If, however, there is no sign of abatement, give quinine every seven hours without reference to fluctuations, for practically there are no fluctuations to guide us. Possibly, after a course of this treatment, there will set in a marked fall of the temperature. This may not approach the normal, but it indicates an effort of nature to reach the normal state. In every case it is wise to embrace that fall and assist nature, by giving a large dose of quinine. All experience shows this to be the moment to give the drug.

If severe bilious symptoms are present they are to be managed as indicated above, where the lines of treatment are laid down. This is precisely a case which should early be brought under the influence of quinine, as the life of the patient is endangered. If we cannot treat by the mouth, we must treat by giving enemata of 10 grains of quinine in liquid starch, and hypodermically $\frac{1}{10}$ of a grain of elaterium.

When in the course of a long-continued fever the arms and legs become cold, with a clammy sweat on the brow, and stoppage of the urine, we must see that free stimulation is applied. In order to restore the circulation, roll the patient in hot blankets, apply mustard to the calves of the legs, nape of the neck, and spine; or better still, give a hot bath with plenty of mustard in it. Give brandy in beef-tea (either by the mouth or by the bowel), to keep up the action of the heart. Should this treatment not be effectual, give hypodermically 20 or 30 drops of ether or the same amount of brandy. If convulsions are marked, give 20 or 30 grains of the bromide of potassium three or four times a day. (See Fig. 7, p. 45.)

In the typhoid remittent form, we have symptoms which suggest that the patient is suffering from a hybrid between typhoid fever and malarial fever of a pernicious type. The treatment here resolves itself into the bringing of the system under the influence of quinine, and then most careful nursing. The patient should be kept in a well-ventilated room with a small fire in it. When there is a tendency to coma, apply cold to the head. Nurse night and day, and treat symptoms when they arise.

Black-water fever.—In all the above forms of fever our sheet-

anchor has been quinine. Here, however, the best authorities affirm that this drug is not so effectual, and the explanation given is that black-water fever is not purely malarial. The following treatment is on the right lines. Make certain that the bowels have been freely acted upon, then give a full dose of Warburg's tincture (say 6 or 8 of the tabloids, as prepared by Burroughs, Wellcome & Co.). If this should be parted with, try again. If not successful, then dissolve the tabloids and give them in the form of an enema with thin starch. If there is a free flow of urine coloured like porter, the patient should be kept warm and comfortable. If there is the slightest sign of a remission of the fever, give quinine in a full dose by the mouth, or by the bowels (10 grains), and alternately with the quinine give 10 drops, freely diluted with water, of the tincture of the perchloride of iron. The consensus of medical opinion inclines to the belief that quinine is not so active in hæmoglobinuric fever. Some withhold quinine and give 10-drop doses of oil of turpentine every four hours. A blister to the back of the neck is often beneficial. If there is any sign of a suppression of the urine, experience tells us that the kidneys are most relieved by those means which promote perspiration, and by applications to the loins. Baths are to be resorted to. Considering everything, a hot-mustard bath given in the following way is the best: the patient, wrapped in hot blankets, sits for half-an-hour, with his feet and legs fully immersed in water as hot as can be borne, to which a liberal supply of mustard has been added. The blankets are to envelop the patient, so that he is steamed indeed. This relieves the cerebral congestion and headache, and should bring on a free perspiration. The bath may be repeated three or four times in the day. If the head and hands of the patient are bathed with cold water, it will afford great comfort to the already overtaxed sufferer. Hot fomentation cloths could also, every half hour, be applied to the small of the back during the intervals of the hot foot-bath, or a warm pack could be given several times a day. When in spite of all that is done the skin is hot and dry, little urine passed, with a constant pain at the small of the back, indicating congestion of the kidneys, we get the best of results from the hypodermic injection of $\frac{1}{10}$ grain of pilocarpine. This should cause beads of perspiration to break out all over the body. If there is great bilious vomiting, together with suppression of the urine, we must act powerfully on the liver. To this end give $\frac{1}{20}$ of a grain of elaterium under the skin. This should produce profuse watery evacuations. Another way is to give 5 grains of the compound powder of elaterium, by putting it on the tongue

and washing it over with a little water. Give copious draughts of barley water. To resuscitate the heart and keep up the strength, it is absolutely necessary to give stimulants. When the pulsations of the heart do not exceed 40 or 50 to the minute, there is always a danger of swooning away. This dangerous period may often be tided over by a little cold champagne or brandy, given in teaspoonful doses, at intervals of a quarter of an hour. If possible give the stimulant ice cold. An authority recommends hock in preference to all other stimulants. In order to keep up the strength, give every two hours some egg-flip and milk in a little hock. Later on let arrowroot and chicken soup be resorted to. When the patient is recovering, let him take, ten minutes before food, 5 drops of liquor strychnine to quicken the digestion and appetite.

Let it be repeated:—the sheet-anchor in the treatment of fever is quinine. This is specially so in the treatment of the acute affection. Where it is life and death, we must here also cast our anchor, according to our present knowledge. Experiments have abundantly shown that the *plasmodium malarie* parasite is extremely sensitive to the action of this drug. Indeed, it has been shown, that after a few doses of quinine, this parasite seems to disappear from the blood altogether. Some say, too, that quinine stimulates the white blood corpuscles in their soldier-like office of removing the intruders and the melanin from the circulation. It thus has a double action. Children can take comparatively large doses (say $1\frac{1}{2}$ grains to a child under one year), but it is wise to watch them with some degree of care. When the system is brought under the influence of quinine there are a series of marked symptoms set up named cinchonism. There is a great buzzing in the ears, with dulness of hearing, a sense of fulness in the head, &c. When these phenomena are produced it is not necessary to push the drug further. Quinine is generally looked upon as a prophylactic in that it helps to arm the system against fever. There is no drug which we, with our present knowledge, can say will do this wholly. All new-comers to Africa should take 2 grains of quinine every night and morning, with this object in view. Again, should one be much exposed to the sun or to marshes, 5 grains should certainly be taken before and after the exposure. If, too, one feels weary and disinclined for work, with a feeling as if fever were “hanging about” the system, he should take at once a full dose of Warburg’s tincture (six of Burroughs, Wellcome & Co.’s tabloids), and in all probability the impending fever will be averted.

The generation of the specific organism which occasions malarial

fever is not due to wet and damp, as it has frequently been shown to disappear in malarial regions during the height of the rainy season, nor is it altogether due to the decomposition of vegetable life, as we have many middens in countries that are free from malaria. It seems to be dependent on a number of factors, such as damp, porous soil, rank vegetation, a certain degree of temperature, together with want of cultivation.

Damp, swampy soil, when it has been drained and cultivated, seems to lose its sour properties, and no longer to give off the miasm of malaria ; should it, however, as has been proved over and over again, be allowed to revert back to the primitive state, malaria of a pernicious type again prevails. It has been shown that drainage sometimes increases the malaria, but this is explained by the underlying vegetation now being brought into contact with heat, it having been previously covered with water. The same explanation is offered when outbreaks of malarial fever result from excavations, digging of wells, trenches, railways, and other disturbances of the soil.

The poison is, to a great extent, confined to low-lying ground, especially to land running along the foot of mountain ranges, and does not extend to any great altitude. At what elevation it is absent depends on a number of factors. It passes easily along the surface from one region to another, and is often carried up ravines and gullies. It is absorbed by running water, and its dissemination is prevented by trees and vegetable life. It is a mistake to clear all the green grass from the soil, as this is nature sealing up the pores under our feet.

Acclimatisation, in the sense of being fully habituated to the malarial influences, is not believed in by any authority, but acclimatisation in the sense of the system acquiring a partial immunity from the disease, by residence in a malarial country, is borne out by facts. The usual experience is, that, when a European enters Africa, he has a great deal of fever, probably of the gastric intermittent type. After residence for a year or two, it is found that he takes fever less frequently, and that of a less violent type. Instead of having fever every month, he now has it every year or even less frequently. The system has undergone a kind of acclimatisation. Again, it is a common experience, that, if a resident in the highlands goes down to the hot plains, he has an attack of fever, and *vice versâ*, if one resident in the lower parts ascends to the colder highlands, he is almost certain to be stricken down with fever. Almost all travellers say, that, while they are on the march they enjoy good health, and a comparative immunity from fever, but

that, when the excitement is over, and the strain removed, they are sure to have a severe attack of fever. The nervous system accounts for a great deal here. In those who have long been resident in malarial countries, there is a kind of acclimatisation going on in the system, not altogether accounted for by the improvement in the cultivation of the soil, house accommodation, mode of life, &c. The system begins to adapt itself to the new environment by bringing about physiological changes. These are found mainly in the circulatory system, the liver, and the spleen. Some of the organs are depressed, some are elevated. To this extent is there a form of acclimatisation. As to the length of time which even this process of being habituated to the new influences takes, it is beyond our power to calculate. Probably it varies greatly in each individual.

Small-pox.—This is a specific disease due to a poison in the blood. It is infectious and inoculable. We do not know the nature of the virus. The negro races are most highly susceptible to the poison, although with them, as with Europeans, vaccination imparts to the system a certain power of resistance. A second attack is unusual. A typical attack begins with a chill, when the fever may mount up to 104° F. Headache, pains in the back, vomiting are all present as in other cases of fever. As a rule all those symptoms of disturbance remain or increase in severity, till the characteristic eruption is seen on the body.

This eruption appears first on the face, about the third day of the illness, and in a couple of days more is found all over the body. It is first seen as a small congested pimple with a hard base, and feels like small-shot in the skin. This is the beginning of the "pock." Fluid forms in the true skin and raises up the horny part of the epidermis into a vesicle (*see* Fig. 1). This takes place about the sixth day. By-and-by this vesicle contains pus which is purulent, and is at its height about the ninth day of the disease. Each pustule is surrounded by a red rash. In most cases the fever falls as soon as the eruption is apparent, and remains down. As soon, however, as the pus appears in the "pocks," the fever again rises, and sometimes the skin of the whole body becomes swollen, red, and irritable. We must remember that the "pocks" are on the various mucous membranes of the body, such as the mouth, nose, eyes, as well as on the skin. When this swelling and redness appears, the patient complains of sore throat, hoarseness, blindness, deafness, diarrhoea, &c. During this period a foul odour rises from the sufferer—he is "stricken."

Now begins the drying-up period. The pustules become dark

scabs and in three weeks are ready to fall off, leaving pits in the skin.

Treatment.—If the case is mild, and the pustules few in number, little should be done beyond isolating the sufferer, giving rest in bed, and careful nursing. At the beginning, if there is delirium and excitement, give bromide of potassium in 30 grain doses or 15 grains of Dover's powder. Morphia injected subcutaneously, say two of the $\frac{1}{8}$ grain tabloids, would be in the right direction. If there is low muttering and prostration, small quantities of spirits and good food must be given freely. In order to prevent pitting of the skin, protect the surface of the body from the air and light, by anointing every day with carbolised or olive oil, after sponging with warm water. Frequent spongings with warm water, and dusting freely with starch or oxide of zinc, allay the great irritability of the skin. When there is great soreness of the throat, give warm bland drinks, and if matter comes from the nose or back of the throat, use a lotion containing boracic acid. Keep the patient clean, attend to the eyes, and if there is irritation of these delicate organs insert a drop of castor oil. When the scabs are black and offensive, a bread or charcoal poultice may be applied to loosen them and allow the pus to escape. It is a matter of nursing.

Mumps.—This is an acute, specific infectious disease which occurs mostly in epidemics, and is characterised by inflammation of all the glands around the mouth which are engaged in the secretion of saliva. The functions of the various glands are in abeyance, so that no saliva is elaborated. The inflammation of the glands seldom goes on to suppuration. The onset is sudden, marked by shivering, vomiting, and fever up to 103° F. or more. In two or three days the glands around the mouth enlarge, become red and painful, so that the mouth can only be opened with difficulty.

Treatment.—Rest in bed; if the bowels are confined, give a slight laxative, such as a full dose of castor oil, or a seidlitz powder. Apply hot fomentations to the affected region. If the disease runs on to suppuration, the pus should be removed early.

Whooping-cough.—This is a specific *infectious* disease seen mostly in young people, characterised by a cough which comes on in paroxysms of frequent short expiratory efforts, followed by a long inspiration, which produces the characteristic "whoop." Writers on the subject define three stages, (1) *catarrhal stage*, when the affection is like an ordinary cough, and lasts for ten or twelve days. This leads on to (2) a *convulsive stage*, when there are great attacks of coughing, characterised by the whoop; (3) *stage of decline*. It is becoming common amongst young African children.

Treatment.—There is no special remedy. All sorts of things have been tried with the view of arresting the attack of coughing. Morphia, $\frac{1}{10}$ of a grain, seems to give the best results. It should, however, be carefully watched. Attention to diet is most essential. Give small quantities of food at short intervals. Milk, eggs, and puddings are best for children.

Leprosy.—This is a specific disease which is endemic to all parts of Africa. Its commencement is marked by inflamed swellings or nodules which arise in the skin or on the course of certain nerves, followed by anæsthesia and local death. It affects chiefly grown-up persons, being very rare before the period of puberty. At one time this disease was found all over Europe, and even now is seen in Scandinavia. It prevails at the present day in tropical countries, where there is much marsh, on the banks of great rivers or near the sea. It is specially severe on weaklings who are poorly fed, poorly clothed, and dirty. Fish has been suggested as a predisposing cause.

The disease is only, in a very slight degree, contagious, but it is so. It is due to a specific micro-organism. This organism sets up a chronic inflammation, with great increase of the cells of the tissues. The skin and the nerves swell up, and passing through changes, die. It begins very gradually. Patches of red puffy skin appear, with nodules below. In Africa it is usually first seen on the face, as the forehead, nose, and ears, and gives the sufferer an unsightly appearance. As these spots pass away others appear. Another form has not only the red patches, but others which come on the hands, feet, or body, which are void of all feeling, paler than the true skin, and shining. The hairs in these white patches become grey and fall out. Little blisters and ulcers form over the joints, and eventually the parts begin to die. A third form appears as swellings in the skin of the face and extremities, producing hideous deformity. The skin over the swellings ulcerates, forming offensive sores, which extend deep into the tissues, causing death of the muscles, tendons, and even bones. The eyes and nose may be involved, as well as the mouth and throat. After a horrible existence, death, in from two to sixteen years, ends the scene.

Treatment.—The disease is, according to our present knowledge, incurable. The patient should, if possible, be removed to a healthy locality, and the general health attended to. The pain may be alleviated by hot baths in which anæsthetics are dissolved. By the isolation of leprous persons from healthy individuals, the disease can be stamped out.

Syphilis.—This disease has all the characteristics of a long

drawn out fever. It is a specific eruptive disease, which is only contracted by direct inoculation. At the point where the infectious matter has been communicated (usually the genitals), there is a small abrasion or sore, which may seem insignificant. The lymph glands in its neighbourhood are, however, inflamed. Later on in its course, the skin over the body and the mucous membranes are affected; and later still, it may be months or years after, the deeper tissues, as the muscles, bones, and internal viscera, are involved.

This disease, while it affects all nationalities, ranks, and ages, is chiefly seen in youth, and owing to the larger area of the mucous surfaces of the genitals, is most common in women. Dark races and orientals suffer severely.

The poison of syphilis enters the blood by some breach in the skin or mucous membrane. It can only do so by actual contact, and is contracted in kissing, suckling, vaccination, circumcision, or coition, and this last is the most common. One attack usually gives protection, but second seizures are known. The disease begins to manifest itself in from thirty to thirty-five days after the actual contact. It is usual for writers to describe the disease as having three stages, but these often overlap one another.

First, Primary Stage.—From thirty to thirty-five days after exposure to the virus, there appears on the affected spot, usually on the prepuce or foreskin, a small dusky-looking pimple, which is not very painful. This pimple sloughs at the top, leaving, in six or seven days, a small ulcer surrounded by a hard base. This is the “hard chancre” spoken of in books. It comes to its height in six weeks or so, and then goes away, leaving a slight scar. During the growth of this pimple, the glands in the neighbourhood have been growing too, accompanied by no great pain, but when the sore goes, they feel like hard kernels under the skin. Something has been going on in these glands, it may be with no great inconvenience, fever, or pain, but something of a serious nature. This hardness may remain for six or eight months.

Second Stage.—This comes on insidiously at a variable period. At first there is slight fever and “out-of-sortness,” accompanied by eruptions on the skin, ulcers on the back of the throat, affections of the eyes, especially of the pupils, &c. Usually there is no itchiness and no desire to scratch. Later on, these ulcers of the throat, &c., increase, and the neighbouring glands become hard. The hair falls out in patches. Pains are felt at night in the bones of the leg and joints.

Third Stage.—This comes on also at a variable period. It has

even been known to appear before the second stage has disappeared, and it usually continues for years. This stage manifests itself by the presence of tumours, which permanently destroy the parts affected. These tumours may affect the bones, or the muscles, or the viscera. Often the large joints are chronically inflamed. The nervous system, too, may be seriously affected.

Treatment.—The treatment for syphilis is mercury in one form or other. *For the first sore or chancre on the penis:* destroy the little pimple by means of fuming nitric acid or strong sulphuric acid. Let one drop fall on the ulcer. Then wash the parts thoroughly with soap and water and apply the following lotion: calomel 10 grains, lime-water 2 tablespoonfuls. This will produce the famous black wash. Another way would be to dust the sore, after destroying it, with pure iodoform, or iodoform ointment (iodoform 1, oil 8); then give blue pill 3 grains, or grey powder (Hydrarg. c. creta) 4 grains, or the green iodide of mercury 2 grains, three times every day. The object is to bring the system under the influence of mercury. If there is a tendency to diarrhœa, by which means the mercury will leave the system, give a little opium to stop the diarrhœa. Continue this for two months, unless the gums and mouth become very sore, in which case stop the drug at once. If mercury has been given, there may be no secondary stage. If this *second stage* has appeared in the form of eruptions, and rashes, and sore throat, then continue the mercury. This drug can be given in many ways, but perhaps the method of rubbing is best. Take a small teaspoonful of the blue ointment and rub it in freely over the inner side of the thighs or over the chest and abdomen. Continue the rubbing for at least half-an-hour. In the morning wash these surfaces with soap and water, to remove the greasiness. Do this every day. There are many other methods of bringing the system under the influence of mercury, but for Africa, the above is the best. Some give mercury hypodermically; $\frac{1}{3}$ grain of the bichloride of mercury in 20 drops of water is injected into the buttock.

In the Third Stage.—Give 5 grains of the iodide of potassium with 30 drops of the liquor of the perchloride of mercury three times a day. When a patient is taking mercury, smoking should not be indulged in; nor should coffee, fruit, or opening medicines be partaken of. Wash with care, twice every day, the teeth, gums, and back of the throat.

The new drug airol being tasteless, odourless, and insoluble in water, spirits, or glycerine, is very highly spoken of, and by many on these accounts is preferred to iodoform. It is specially useful in the primary syphilitic sore.

CHAPTER VIII

BLEEDING AND ITS METHOD OF CONTROL

BLEEDING, or hæmorrhage, is one of the most serious accidents that can befall a human being, and if not controlled will lead to swooning and death. In the body there is but a limited quantity of blood, estimated at about one-tenth of the weight of the frame, and as life may be seriously jeopardised in a few minutes, if one of the large blood-vessels be injured, it is imperative that all should know what to do in a case of emergency. The heart is the centre of the circulation of the blood, and is a hollow muscular organ, lying behind the centre of the breast-bone towards the left side. (See Fig. 8.) It consists of two chambers, the right and the left. The heart acts as a great suction and force-pump, alternately contracting and relaxing. The two parts of the heart beat simultaneously. The right half forces the blood into the lungs, where it is oxidised, and the left half pumps the same through all the tissues of the body. (See Fig. 19.) The pulse can be felt whenever an artery is compressed against a hard substance, as a bone, and is merely the beat of the heart in the vessel. It is caused by the heart sending forward the blood in jerks, together with the elastic recoil of the vessel. When the blood leaves the left heart it is contained in one large vessel—the aorta. This soon gives off branches, which go to the head, neck, and upper arms. The main vessel then coils abruptly round behind the heart, and descends through the chest and abdomen, supplying the viscera in its course. Towards the lower part of the abdomen, while it is deeply placed, it divides into two main vessels which supply the lower limbs. As the arteries go further and further from the heart they become smaller in caliber, their various coats becoming less in thickness, until they begin to ramify and lose themselves in what is known as the capillaries. These form a dense network in every part of the body—so dense that it is impossible to insert the finest needle without lacerating one or more,

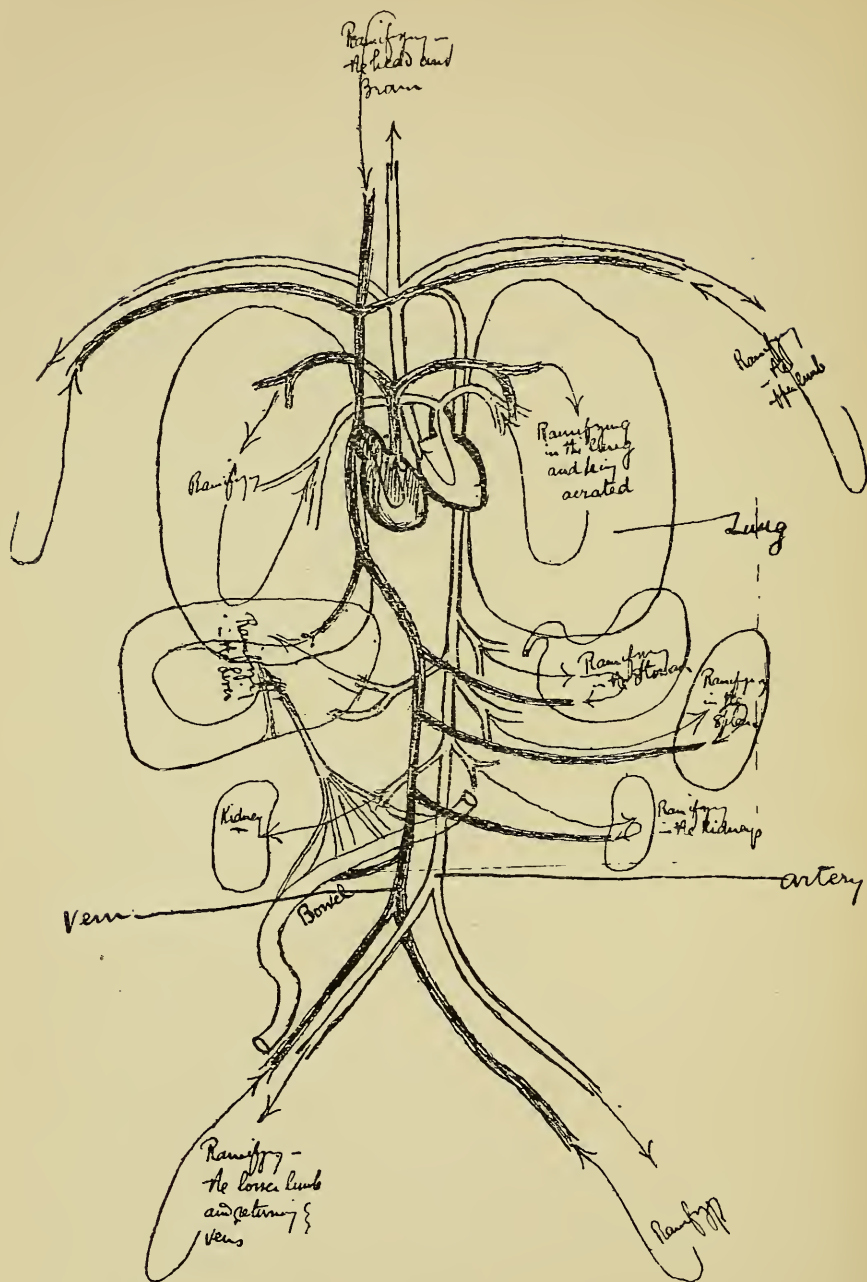


FIG. 19.—DIAGRAMMATICAL REPRESENTATION OF THE CIRCULATION OF THE BLOOD IN THE VISCERA AND LIMBS.

(Venous circulation dark shaded.)

and allowing an extravasation of blood. The coats of the capillary vessels are so fine that nutrient fluids and gases from the blood pass out to the tissues, and waste products pass into the blood. After bathing the tissues, the capillaries reunite into larger and larger vessels, and travel upwards from the limbs towards the heart, under the name of *veins*. As the veins are travelling against gravity many of them are supplied with a wonderful series of valves. The veins, uniting, enter the heart through a large vessel, and pour their contents into the right side.

The blood in an artery is bright red in colour—this is due to the oxygen of the lungs, whereas the blood in a vein is dark in colour and loaded with impurities. *The bleeding of an artery is very characteristic.* It comes forth in jets, and may spout a considerable distance. Bleeding from a vein is of an oozing nature. If a large artery be severed, the first gush of blood may prove fatal. Fortunately the patient usually faints, and this is the best thing that could happen, as in this state the heart relaxes its beating, and the blood pressure is lowered.

It is most important to have some idea of the course of the main arteries of the body. With this object in view, it will be wise to study the accompanying sketch. (*See Fig. 20.*) It is not essential to know the arterial names, but it is necessary to know the general course of the largest vessels. Arteries are carefully guarded by nature, and are so placed that they seldom receive a blow. If a person is about to receive a knock on the head he instinctively ducks down, and in so doing protects the main vessels of the neck. All of us instinctively crouch in the presence of danger. When we sleep we roll ourselves up, with the head bent forward, the arms folded, and the lower limbs flexed on the body. By so doing we unwittingly have all the main vessels to the inside, and protected against danger. Look at Fig. 20, and conceive the man in a crouching position, and this will be apparent. If he were rolled up like a ball, the head and shoulders would project, but no main blood-vessels would be exposed. The knees too would project prominently, but here nature has made a wonderful provision. The main vessel (femoral artery), running down the inside of the thigh, dips into the midst of the great muscles of the leg, and comes out at the popliteal space (behind the knee), where the leg is firmly flexed. If a man rolls himself into a ball you can do him comparatively little injury. You can make a considerable incision over the shoulder or outer part of the arm, and cause little bleeding, but if you make a cross-cut of an inch, or a stab even of half an inch in depth, into the armpit or inner part of the arm, you might injure fatally. So too with the lower limbs. You

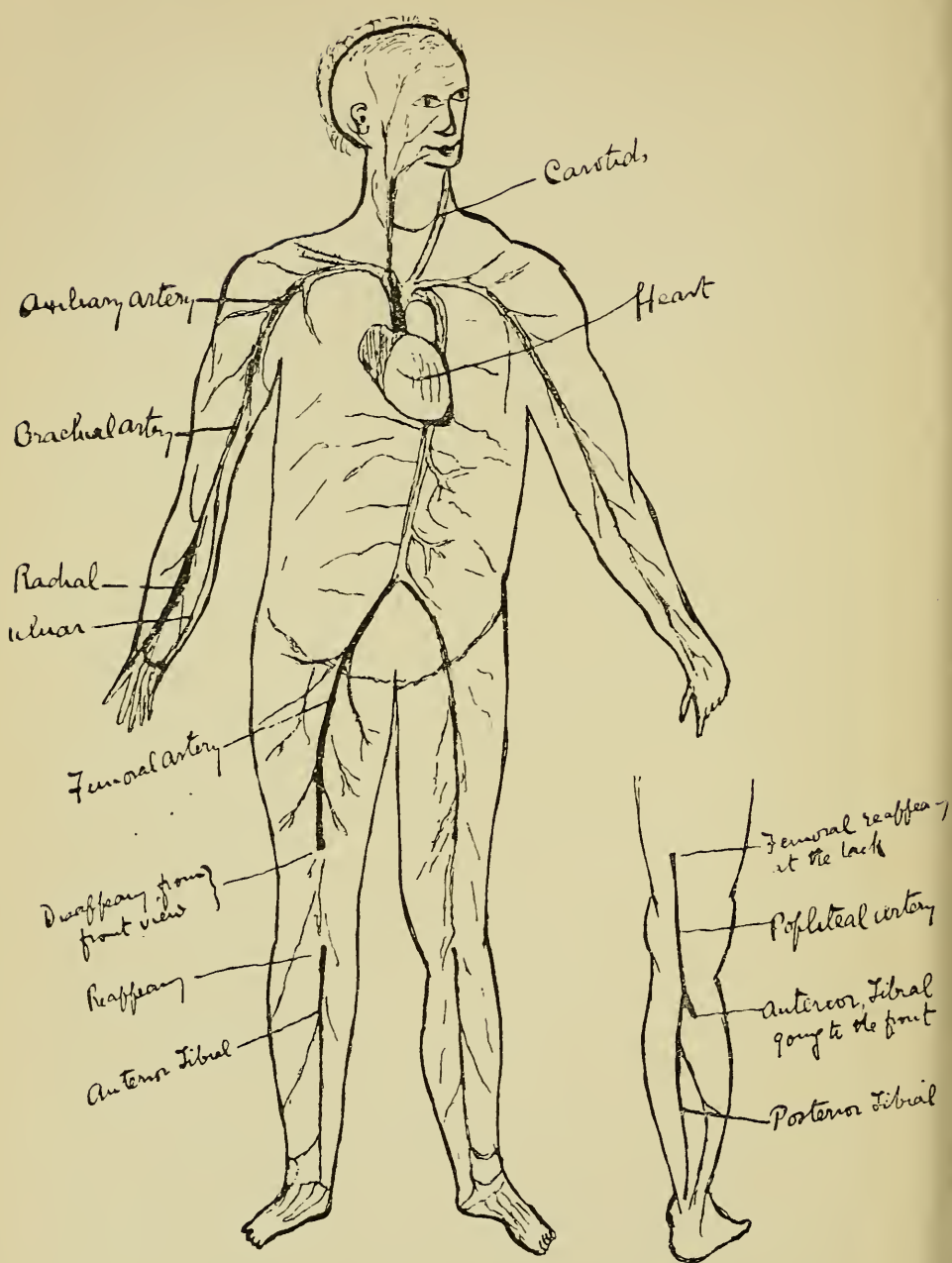


FIG. 20.—COURSE OF MAIN ARTERIES IN ARMS AND LEGS.

might make a cut down the hips, and back of the thighs, a foot in length, and do no great harm, whereas if you make a cut an inch or so, on the inner side, you might fatally injure the femoral artery.

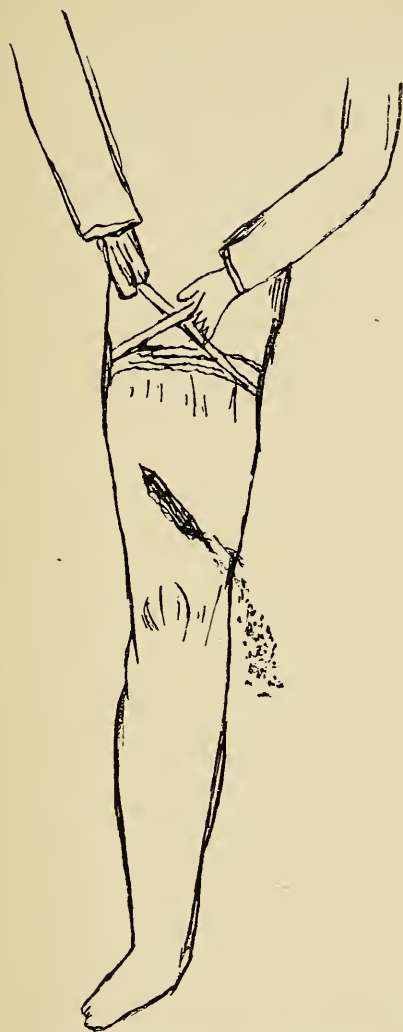


FIG. 21.—TOURNIQUET APPLIED TO THE LEG.

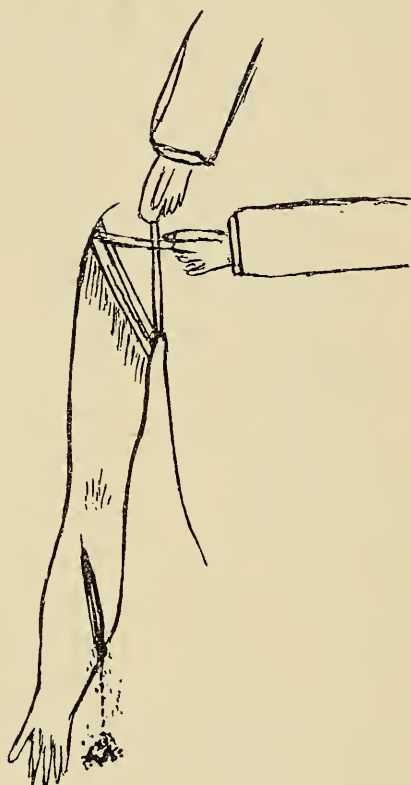


FIG. 22.—TOURNIQUET APPLIED TO THE ARMPIT.

Treatment.—In certain cases, where the injured vessel is no too large, there is a natural arrest of bleeding; that is to say, when the parts are left to nature, there is a cessation of bleeding. If the

artery is wholly cut through, it contracts in caliber at the spot where it is severed, and also retracts within its sheath. The blood coagulates, layer by layer, until a natural plug is formed and stops the bleeding. If the vessel is large, the clot will be washed away by the pressure of the blood, and the patient will bleed to death. If the vessel is of medium size, the clot may be washed away, but fainting supervenes and reduces the pressure, and allows a clot of large dimensions to form. If the artery is only partially

divided when it contracts in caliber, and retracts within the sheath, it will be kept open, so that it gapes, and no clot will be formed.

We cannot depend on the formation of clots, so must adopt some artificial means of restraining the flow of blood, till the cut surfaces adhere together and heal. *First*, then, we control the bleeding by *immediate pressure*; that is, we grasp the bleeding point and press it freely. If we see a bleeding artery, we grasp the limb above the spot and press with some degree of firmness. Pressure can be kept up by applying a pad of lint, or a coin rolled in cloth, and held firmly by means of bandages. Again, *pressure can be applied above the artery from whence the blood flows.* (See Figs. 21 and 22.) The pressure has to be applied to the inside of the upper arm, where the brachial artery can be grasped by the hand even, and the bleeding controlled.

Pressure on the middle of the groin will grasp the femoral artery, and so control bleeding from any part of the leg. The hand can only grasp for a little time, but a handkerchief, always to be had, can be



FIG. 23. — HANDKERCHIEF TIGHTLY TIED TO THE ARM IN CASE OF EMERGENCY.

tied tightly, and by means of a stick can be twisted till any desired pressure is attained. (See Fig. 23.) The modern tourniquet is only a long india-rubber cord, with a hook at one end and a chain at the other. (See Fig. 24.) If we stretch this tube and wind it round and round the limb, of course above the bleeding point, and fasten it by placing the hook in one of the chains, we have a most effectual means of controlling bleeding.

At the best, however, this pressure is only temporary, is very

painful, and if long continued will endanger the life of the limb. If a person is healthy, this pressure may be continued for five or six hours in a case of emergency, but longer pressure would not be free from danger. *Permanent pressure* is applied thus: get a large basin with some clean linen cloths. Let the basin be filled with water 30 parts, and carbolic acid 1 part. Gently remove whatever is tied round the disabled limb, and as you do so, wash the parts well with the watery solution. If there is still any bleeding-point on removing the dressings, catch it up by an artery forceps, draw it out from the wound a little, and tie it firmly with cat-gut. Surgeons often seize small bleeding-points by means of such forceps, and twist them round several times, when the bleeding ceases at once. (See Fig. 25.) Cat-gut is the best tying material, as it

is easily absorbed by the tissues. If silk is used, the two ends must be allowed to hang out of the wound, so that, when the artery is quite healed, it can be removed. When the bleeding is stopped, cleanse the wound thoroughly by washing, and dress it with carbolic oil 1 to 10, or with iodoform ointment. Bandage the limb neatly and firmly from the extremities upwards, and give perfect rest.

If the wound is on the scalp, it is only necessary to allow the

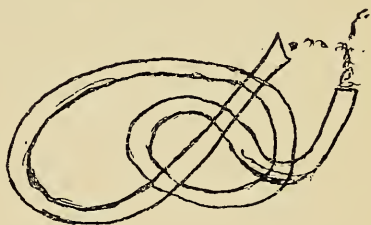


FIG. 24.—TOURNIQUET.



FIG. 25.—ARTERY FORCEPS.

artery to draw itself into the tissues, in order that the bleeding may cease. In such a case it may be necessary to complete the cut. This done, dress in the usual way.

Venous bleeding is known by its deep colour and its continuous flow. Pressure is generally sufficient to stop the oozing, if it is directed over the wounded part. If pressure is applied above the wound, that is further up the limb, it will do harm, as it will increase the flow of blood. In this form of bleeding pressure

should be applied to the course of the vein below the seat of injury. When a very large vein is divided, its two ends must be tied. Oozing from a cut surface is generally venous in character. In order to control it, apply a stream of very hot water, as hot as can be borne, and in a short time the oozing will cease. Apply pressure over the bleeding part by means of a pad in 1-40 carbolic acid, and bandage tightly.

Treatment of all kinds of bleeding should be accompanied by rest in the recumbent position, with the head somewhat lower than the body. As the temperature is likely to be low, see that an extra blanket is thrown over the sufferer. Cheer the patient by assuring him that the bleeding, although it is a great loss, is not serious. When a person faints from loss of blood, allow him to lie until a certain amount of strength has been regained. If he is raised suddenly there might be failure of the heart. Avoid all stimulants, unless there is collapse, as these increase the blood pressure, and tend to the continuation of the bleeding. If there is collapse, hastily inject under the skin a teaspoonful of ether or brandy.

Antipyrin is most powerful and rapid in stopping bleeding.

Ordinary bleeding from the nose is stopped by moistening a simple plug of wool in a solution of this drug, say 1 to 2 of water.

In more severe bleedings, antipyrin may be dusted over the surface, or hot irrigations with a 3 or 5 per cent. of the drug may be used. After the removal of a polypi or the extraction of a tooth, there is often some bleeding. Such may be stopped by antipyrin applied in the above strength. For all forms of bleeding this method of treatment is excellent.

For the coughing up of blood (hæmoptysis), antipyrin in the form of a spray of a 1 or 2 per cent. solution, or by inhalations, has been effectual in stopping the blood, even when in some cases subcutaneous injections of ergotin were not successful.

When the powder is sprinkled over an open wound, it stops bleeding by causing the blood to coagulate.

CHAPTER IX

WOUNDS, BRUISES, BURNS, AND THEIR TREATMENT

ANTISEPTICISM

BEFORE speaking of wounds, it is absolutely necessary to have a clear grasp of the antiseptic and aseptic treatment of modern days.

This treatment depends on the fact that the air abounds with micro-organisms, which, being brought into contact with injured tissues of the body, set up putrefactive changes. These organisms vary in number, quality, vital power, and are of infinite variety. Many thrive in dead tissue, aided by moisture and heat such as a wound on the body affords. All the specific fevers, and most of our other ailments, are due to their presence in the air. It is against these lowly, but, in virtue of their number and virulence, most seriously destructive organisms, that we have to fight. The skin is an impermeable structure to every form of such life, but the moment this outer covering is broken, they pour into the tissues, and set up putrefactive changes, generating toxins or poisons by their very existence. All antiseptic treatment aims at rendering to a wound such protection as is afforded by the natural skin. We have first to destroy the germs that have gained access to the wound, to neutralise the poison they have generated, then to keep the wound in such a state that it will not afford a nidus to the germs, and be enabled to repair itself with all possible haste. We thus really treat the atmospheric surroundings of the breach of skin. Antiseptic dressing is, in fact, an artificial skin. There is another class of low microscopic life, which gains access to the system through some breach in the mucous membrane within the body, or even enters the blood and courses there. Wherever there is a local injury or weakness, they congregate in that spot and set up an internal abscess. Then we might speak of a third set, which,

finding the body reduced in vigour, enters the system, it may be by the internal mucous membranes, sets up the various fevers, all of which run through their own definite course.

The system of treatment we are considering, consists in destroying and casting out of the body the dangerous intruders. This is done by means of certain drugs which we know have the power of rendering inert the organisms themselves or the toxins which their presence generates. Thus carbolic acid dissolved in water, or impregnated in gauze or cotton-wool, has this property. Thymol, eucalyptus oil, boracic acid, salicylic acid, iodoform, perchloride of mercury, have this power, and are all specially useful in their own way.

These drugs are chiefly employed to purify the media surrounding the wound ; the wound itself is only treated by the drugs when the presence of germs within its tissues is suspected.

METHODS USED IN THE TREATMENT.

The methods and material used vary greatly, but the principles are the same in all. Everything surrounding the wound and that which comes in contact with it must be purified. The operator's hands, those of his assistants, his instruments, and dressings are carefully made aseptic with a watery solution of perchloride of mercury, of the strength of one spoonful of the drug to 1000 spoonfuls of water. The wound is irrigated with the same antiseptic lotion. When the operation is over, the wound is closed and covered with a layer of specially prepared gutta-percha tissue or oil-silk "protective," which prevents the constant irritation of the antiseptic. The muslin dressing covering the silk is impregnated with carbolic acid, resin, and paraffin. Here the carbolic acid is retained in the muslin at ordinary temperatures, so that the wound is kept in an antiseptic state for some days. The first layer is applied to the wound after having been soaked in a solution (carbolic 1, water 40) to destroy all germs adhering to the surface. The remainder of the dressing is applied dry, in order to absorb all discharges that may flow off from the wound. This is covered with cotton wadding, impregnated with a strong antiseptic, at the above strength of perchloride of mercury. The whole is then tightly fixed by bandages. When the wound is an old sore, which has not been so treated, and which has been the seat of the growth of innumerable numbers of septic germs, and of smelling discharges, the surgeon does his best to bring the raw surface into

an aseptic state. The wound is washed with very strong carbolic acid, say 1 part to 20 parts of water, or with corrosive sublimate (perchloride of mercury), of the strength of 1 part to 500 parts of water. The washing is done most thoroughly to the extent of scrubbing, and is afterwards treated like the ordinary antiseptic wound. It is not possible, however, to eradicate altogether the evils of putrefaction, after a wound has been exposed to the air for a period of two days, and suppuration has set in.

The latest development in this treatment is, with the most scrupulous attention to detail, to thoroughly sterilise all instruments, dressings, operators, nurses, and everything indeed that comes in contact with the broken skin, and so carry out the aseptic treatment.

The following is a description of a few of the best antiseptics used. The list is full with the idea, that, in Africa, should one drug be absent another may be used.

(1.) CARBOLIC ACID.—This is, at the present time, the best and the most useful. The crystals (in Africa the pure acid is generally a fluid) may be dissolved in water or oil or glycerine. The strong solution is 1 of the acid to 20 of water. The weaker is 1 to 40 of water. It is also used, frequently, in the strength of 1 of the acid to 10 of oil or glycerine. The most recent experimenters discard the oil and speak highly of glycerine.

(2.) CORROSIVE SUBLIMATE (perchloride of mercury).—This is very cheap and very effective. It however corrodes all instruments and makes them unsightly. The strong solution of 1 of the perchloride to 500 parts of water is used for the hands of dressers and those who come in contact with a breach of skin. The weaker is 1 to 1000, while that used for the irrigation of wounds is 1 in 2000 of water. When using this drug for irrigation purposes, always put a little common salt into the solution.

(3.) IODOFORM.—This is a most useful drug, as it has marked deodorising properties. It can be used in a variety of ways, but is often simply dusted on the wound. It is insoluble in water, but mixes well with equal parts of oil or glycerine. Its odour is unpleasant, but it is excellent for natives.

(4.) ANTINOSINE.—This is a new drug. It is a blue powder which dissolves easily in water, and is a sodium compound containing iodine and phenol. It possesses antiseptic properties equal to those of iodoform. It arrests the growth of all pathogenic microbes. It has no odour, no toxic properties, no irritant effects, and is consequently most excellent for a variety of uses. It is specially useful in syphilitic chancres. A $\frac{1}{2}$ per cent. watery solution is excellent

as a gargle for throat affections. It can be used as a powder on external surfaces.

(5.) BORACIC ACID.—This is a very mild antiseptic, and is specially useful in dressing the wounds of mucous membranes.

WOUNDS.

A wound is any breach of continuity of the skin. For the sake of clearness we will divide them into—

1st. INCISED WOUNDS.

2nd. LACERATED WOUNDS.

3rd. STABS OR PUNCTURED WOUNDS.

4th. GUNSHOT WOUNDS.

An **incised wound** means a clean cut as with a knife. The edges are not ragged or injured in any way, beyond having been severed. There is usually a good deal of bleeding, as the blood-vessels have been freely opened. A stick, however, may give an apparently clean cut, if a hard surface, as a bone, is underneath. If the instrument that inflicted the injury was clean, and the wound looked after and properly treated, it should heal very quickly by what is called immediate union, or union by first intention.

A **lacerated wound** is one that has the edges variously cut into irregular segments, and it may be parts of the tissue killed. Such a wound is seen when a “chikote” or a “shambuck” is used freely, and cuts the skin, or when a log falls on the leg and wounds the flesh. The danger here is not so much the cut, as that the tissues are injured, and septic matter is rubbed into the flesh as it were. The edges, being torn, are usually jagged in appearance.

Stabs are produced by knives or spears, and are always much deeper than they are broad. The first danger is the bleeding, which cannot readily be controlled ; and next comes the absorption of septic poison, as we cannot get into the wound to clean it thoroughly.

Gunshot wounds may present any possible form. It may be a puncture, or it may be a most seriously contused wound. The ball may be lodged in the tissues, together with cotton, cloth, or wadding ; or it may have escaped, leaving a second hole and a long tunnel. When a bullet passes right through any tissue, the hole by which it enters is usually small, while the hole by which it passes out is large, irregular, and with out-turned edges. Small shot, if fired from a little distance, makes a most serious lacerated wound ; if from a considerable distance the shot scatters, and may lodge in

the skin without causing great injury or inconvenience. Usually there is very little bleeding. A native round bullet is most easily deflected, and in passing through tissues, may push a tendon, a nerve, or a vessel to one side without cutting it. It is different with a modern bullet, projected from a rifle, which passes through the tissues, much the same as an augur passes through wood—it lacerates everything in its passage.

Treatment.—The first thing to do is to arrest the bleeding by laying the sufferer in a horizontal position, and firmly grasping the bleeding vessel or applying other pressure by means of pads. It may be necessary to apply a tourniquet or a bandage or twisted handkerchief. It may also be necessary at once to tie the bleeding vessel in order to save life. If it is a *lacerated wound*, wash it thoroughly with soap and water, taking away all dirt, and then bathe the wound for some five minutes at least in 1-20 carbolic, or 1-1000 corrosive sublimate. Do not fear to make it bleed. Tie or twist all bleeding points, and if tendons are cut, unite them each to each with cat-gut stitches. If you are dealing with a stab and cannot control the bleeding by pressing on the artery above, then you must cut down and tie the bleeding vessel. Watch carefully in the after treatment of a stab for rise of temperature, for if this takes place, be sure there is septic poison in the wound, finding its way into the system, and slowly poisoning the sufferer. Here the treatment is to open the wound freely, and let out the pus by free drainage. If nerves or tendons are cut, tie them carefully each to its fellow. If you are dealing with a gunshot wound, in addition to washing with 1-20 carbolic and removing wadding, powdered fragments of bone, &c., use the fingers of your hand, thoroughly purified in 1-20 carbolic as a means of exploring. It may be necessary to put a finger of each hand into the opposite holes and cause them to meet in the wound. Remove the bullet if it is still within the wound. Syringe the wound with 1-20 carbolic, and treat it in the ordinary antiseptic manner. Although you cannot see the various sides of such a wound, it is quite the same as an open sore, only the lips of the various tissues lie in contact one with the other. Having arrested the bleeding, and washed the wound thoroughly with 1-20 carbolic, with great care bring the lips of the wound together with accuracy. Let muscle come to muscle and skin to skin, and keep them in that position by means of a few stitches or by sticking-plaster. This is an admirable method where the wound is of moderate size. Take care, however, to allow spaces between the straps of sticking-plaster for the discharge of blood, or it may be, of pus. In large wounds plaster is not sufficient, we must have something to grasp

the lips firmly, and hold them in position. This is done admirably by ordinary cat-gut, which is supplied by all chemists. Sew the wound as you would sew a bad tear in a great bag, only each stitch must be tied for itself. Continuous sewing may be used where the wound is very clean and there is no tension on the lips. Don't tie so tightly that the skin is puckered, but let the lips lie easily against one another. In doing so it is necessary to be prepared for drainage, as there is almost a certainty of pus being present later on. If the wound is small, allow the most dependent end to remain open somewhat, with this object in view, but in large wounds insert a small piece of india-rubber tubing at the lowermost end. The wound sewn, and the drainage tube inserted, apply a piece of protective over the wound which has been soaked in the carbolic solution. Then apply the pads of dressing and the bandages.

Should one spot appear to form pus day after day, touch this with nitrate of silver and reapply the antiseptic lotion.

Remove the tubes and the dressings in twenty-four hours and dress afresh. Take every care to bathe the whole in 1-30 carbolic lotion. If the stitches tend to tear the edges of the wound, or to cut their way out, the tension is too great on the lips. Remove them at once and apply straps of plaster, or re sew the wound. When the wound begins to heal remove the stitches; they should be removed about the fourth day, and the wound should be quite healed by the seventh or tenth day, if all goes well.

Bruise.—This is an injury inflicted by a blow or a squeeze, in which the skin is not broken, but the internal tissues are lacerated, and the small vessels so affected that there is an extravasation of blood. The skin not being broken the blood remains in the tissues, but below the skin, and thus not in contact with the air. This injury may range from an ordinary black eye, to the internal crushing of the muscles. In the lesser form, typified by a black eye, there is only a slight injury to the tissues, with the rupture of one or two capillaries, which occasions the discoloration. In the more serious, the tissues under the skin, muscles, and blood-vessels are crushed and may die. The amount of blood poured out depends on many things, such as the size of the broken vessels, the laxity of the tissues, &c. If it is under the eye, where the tissues are lax, there is great discoloration; if the scalp, where the tissues are firm, the discoloration is comparatively slight.

The symptoms are pain, swelling, and a marked discoloration. Usually there is little shock, but if the testicle is the seat of the blow, or the breast in a woman, or even one of the large joints, there may be faintness, loss of muscular power, and vomiting. The pain

is numb or dull and aching. The parts rapidly swell, and may remain swollen for a week. At first the discoloration may be dark like blood, but as this undergoes change it becomes purple, pink, and then yellow. These changes are said not to come about where the parts are uninfluenced by air and light.

Treatment.—If the bruise is simple, all that is wanted is rest and a covering of dry cotton-wool or boracic lint. It may be necessary, however, to do something to remove the pain and the discoloration of the part. If the pain is great, put on a warm fomentation sprinkled with laudanum. If blisters form, prick them gently to let out the fluid, but on no account tear off the cuticle that forms the blister or break the skin. Dress with zinc ointment or carbolic oil.

If the bruise is on the leg, give the part absolute rest and use Elliman's embrocation. If the parts tend to mortify and die, apply hot fomentations till the dead tissue sloughs, and dress with carbolic 1-40.

Pugilists, who often suffer from bruises and black eyes, use the following rough and ready treatment. The eyes, with them, sometimes swell so greatly that it interferes with vision. In such a case they puncture the eyelids to let out the serum, and apply a piece of raw beefsteak as a poultice. This has the effect of keeping out the air, and is certainly a cooling, moist application.

It is against all principles to incise the skin, even when the extravasation of blood is extensive. The application of hot fomentations and rest, will, even in such a case, do wonders.

Ulcers of every kind are common in Africa. The natives often suffer for years from unclean sores, which are a tremendous drain to the system. They may appear on any part of the body, but are seen most often on the legs and dependent parts. An ulcer is a "sore," or a degenerate tissue, giving off an unhealthy discharge or "ichor." They may appear on any surface of the body, external or internal. They are common on the mouth, stomach, or bowels; on the eye, nose, or skin. In the present article they are restricted to the skin. An ulcer may be the direct result of an injury; or from defective circulation, such as a varicose ulcer; or from a constitutional cause, such as syphilis, or struma. Careful diagnosis of the cause is the key to successful treatment.

A **common healthy healing sore** may be found on any part of the body, but is most often seen on the lower leg or shin. It is a healing, granulating wound, which is "drying up." Usually a little pus is given off, which is of the consistency of thick cream, and not of an unpleasant odour. It is "sweet." The edges merge gradually into the healthy skin, and are of a purplish blue tint,

indicating that the epidermis (the upper layer of skin) is gradually enclosing the sore. Such a sore may be described as **inflamed**, if the surface is red and angry-looking, the discharge thin and watery, and the sensation complained of as hot and stinging. It may be described as a **weak ulcer**, if the granulations (the little raised-up healing parts) are pale and soft and watery-looking. If there is what is popularly called "proud flesh," it may be described as a **fungus ulcer**.

A **sloughing ulcer** is a grey-looking sore, part of which is being cast off in pieces. A **chronic or callous ulcer** is such as is seen on unhealthy natives. It is generally on the legs, and has been there for months or years. Usually it is oval, with its long diameter running along the leg. The margin is pale and hard like gristle. All the tissues around are thickened from long-standing inflammation.

Treatment.—What is imperatively needed in treating such ulcers is absolute cleanliness. In dealing with an ordinary native sore, wash away thoroughly the dirt and pus of the past months. Then purify its surface by some antiseptic lotion, and keep it free from irritation. Stimulate the part so that more blood will come in to it; look also to the venous circulation, as this is often at the bottom of long-standing sores. This done, treat the constitution by tonics and good food.

What is required most of all in the treatment of a common healthy sore is *rest*. If this cannot be given, by allowing the limb to lie in an elevated position, then use an elastic woven bandage. This should be put on before rising in the morning, and taken off after retiring at night. An ordinary sore should be washed and soaked in corrosive sublimate 1-500 for five minutes, then dusted with iodoform and dressed with lint soaked in 1-40 of carbolic acid. Let the lint fit the sore exactly. Over this put a piece of oiled silk, which should overlap the lint by about half-an-inch all round. If the silk tends to irritate the skin, rub the surrounding tissues with vaseline or oil. Over all, bandage the limb from the toes upwards with the above woven elastic bandage, or a bandage of the ordinary texture.

The following are good lotions for all sores. It may be that one is at hand, while another is not procurable: (1) *pure filtered* and boiled water; (2) *boracic acid* dusted over the part; (3) *chloride of zinc*, 2 grains to 2 tablespoonfuls of water; (4) *corrosive sublimate*, $\frac{1}{4}$ grain to 2 tablespoonfuls of water; (5) *black and yellow washes* are on the same lines as the sublimate; (6) *hydrate of chloral*, 3 grains to 2 tablespoonfuls of water; (7) *dilute nitric acid*, 5 drops to 2 tablespoonfuls of water; (8) *iodine*, 1 grain to 20 tablespoonfuls of

water ; (9) *sulphate of copper*, 1 grain to 2 tablespoonfuls of water ; (10) *nitrate of silver*, 5 grains to 2 tablespoonfuls of water ; (11) *sulphate of zinc*, 2 grains to 2 tablespoonfuls of water ; (12) *carbolic acid*, 1 part to 40 of water.

Another very excellent remedy, for the treatment of ordinary native sores, is to dust the ulcer every day, after washing, with ordinary flowers of sulphur. This is an antiparasiticide, and seems to have marked effect on the low microscopic life of ulcers. It is inexpensive, and is usually at hand.

If the sore seems weak, in that it looks pale, soft and flabby, it needs stimulation ; in such a case, take an ordinary stick of nitrate of silver and pencil the parts over, dress with dry lint and a bandage. Rubbing the sore with crystals of bluestone (sulphate of copper) is on the same lines.

In treating a sloughing ulcer, it is necessary that the patient should have good food and good hygienic surroundings. If the slough is spreading up or down the leg, it is well, at once, to apply strong nitric acid to the dead line, and so destroy the poisonous matter that is acting on the weakly tissues. This done, effectively wash with perchloride of mercury (1 in 1000), or carbolic acid (1 in 40), and treat as above.

In treating an indolent callous ulcer such as is often seen amongst African natives, it is imperative to act effectively. In such a case the edges of the sore are hard like cartilage, which for over a period of years have been laid down in layers, and when seen are capable of being torn off in strips. Blisters may be tried with the object of revivifying the sore, but will do little ultimate good. The following, however, is effective. Treat the part with this local anæsthetic by means of a spray :—

Chloroform	.	.	.	.	.	10 parts,
Ether	.	.	.	.	.	15 „
Menthol	.	.	.	.	.	1 part ;

the resulting deadness to pain will last for five minutes. This effected, thoroughly scrub the greenish stinking surface with carbolic (1-40) and soap. Then deeply incise the callous cartilaginous edges thus :—

Take a sharp bistoury, and beginning at the centre of the sore make a series of cuts outwards through the hard edges. Cut deep into the fascia and through the edges. The wound must gape widely and bleed freely. The bleeding will be controlled easily by pressure. After this operation the wound looks ghastly, but life

will have been brought into it and it will start afresh on healing lines. If this wound is dressed with iodoform and covered for a couple of days a great change will be apparent.

What might be described as **angry-looking, irritable sores** are seen amongst the natives, and give a great deal of trouble. There is great pain, redness, and swelling. Begin the treatment of such by giving a brisk purge, as one drop of croton oil on the back of the tongue. To relieve the pain give 30 grains of bromide of sodium with antipyrin 10 grains three times a day. Then treat the sore with carbolic (1-40) as above. If this does not give relief, then make a solution of cocaine 8 parts to water 100 parts, and soaking lint in this, put it on the sore for 15 minutes. This will relieve the pain. Then with a solution of nitrate of silver 35 grains to 1 tablespoonful of water, paint the edges, and wash the inner sore. Thereafter apply cold-water dressing for a few days, and let it have absolute rest.

The new drug airol is highly spoken of as a means of treating ulcers. This is a green powder, tasteless, odourless, and insoluble in water, spirit, or glycerine. It is excellent for ulcers of the leg, which in a short time become painless and dry up. The granulations become firm and healthy. This drug is excellent for treating ingrowing toenail, and small wounds of every kind. The fact that it is odourless gives it the preference over iodoform.

Burns and scalds may be considered together, in that they are both injuries to the skin caused by excessive heat, or by a strong chemical agent destroying the same. A **burn** is caused when a flame, a hot solid, a metal in a liquid state, or a chemical, such as nitric acid, destroys the tissues of the body. A **scald** is caused by hot water, hot oil, or other liquid injuring the skin. Both present similar features, and require the same care and treatment. In minor surgery these accidents are simple, but severe burns or scalds menace life.

The skin may simply be reddened or blistered, or the true skin may be destroyed; deeper still, the muscles and bones may be killed.

The danger to life depends on the extent of the surface involved, and this is the more serious in the very young or the very old. It is estimated that if one-sixth part of the surface of the body is destroyed, the injury is likely to be fatal. A burn on the body is more dangerous than the same extent of injury on any of the limbs. The pain is usually intense, and the shock to the system in even a small burn is very great. Shortly after the accident, the pulse bounds, while the body may be cold and the sufferer faint. In

twenty-four hours there comes a reaction : fever supervenes, and some internal organ, as the lung, may be congested.

Treatment.—After receiving a burn, even one of the simplest, as by lifting a red-hot cinder, make *at once* a paste of bicarbonate of soda and water, apply the doughy stuff to the part, and the pain will be relieved. This must be done before the blister forms. The application of ordinary brown soap at this stage is good.

In a very severe burn, what is called for, first of all, is attention to the swooning patient. The shock may be so great, that there is danger of collapse. Cover the sufferer with blankets, put hot-water bottles to the feet, and give a wine-glassful of hot brandy or whisky to stimulate the heart. If the pain is very great, apply a watery solution of opium to the injured surface, or give a hypodermic injection of morphia, say $\frac{1}{2}$ grain. Then, by means of scissors, most gently remove the clothing, taking one limb at a time, and dress it. Never attempt to take off the clothing in the usual way. Puncture all blisters at the dependent parts, and allow the fluid to drain off, always saving the upraised cuticle. (*See Fig. 1.*) What is wanted is, as soon as possible, to exclude the air. To this end cover the burn with ordinary flour or starch, or flour and boracic acid, and envelop the limb in cotton-wool and bandages.

Iodoform dusted over the surface is good. Antinosine is also excellent, being effective and having no smell. Burns from gun-powder should be carefully washed and syringed with hot water in order to remove the grains of powder, and treated as above.

When the burned surface is literally charred, the best thing to use is the old-fashioned carron oil, or a modification of it, made thus : of an oil made from eucalyptus 10 parts, olive oil 90 parts, take one cupful and mix with a cupful of lime-water. Soak cotton-wool in this, and apply to the burned surface. Keep the dressing on by means of lint and bandages till the patient says it is painful, or until a discharge appears below the dressings. Then take off the oily dressings and wash with warm carbolic lotion (1-40), and dust with iodoform or antinosine. It may be that parts of the injured surface will begin to slough, in which case the whole should be enveloped in linseed-meal poultices, and the sloughs washed with the above warm carbolic lotion.

When extensive burns of this nature heal, there is usually great after-contraction. This should be taken into consideration. If it is in the neighbourhood of a joint, the limb should be put upon a splint.

CHAPTER X

MINOR SURGERY

An abscess is a circumscribed collection of purulent matter formed in the superficial tissues of the body or some of the deeper organs. In its growth the capillaries of the part are first inflamed and gorged with blood ; the delicate vessels are weakened, so that a great amount of fluid and white-blood corpuscles exude and become pus. This dead matter dissolves the delicate tissues in which it is diffused and eventually makes for itself a cavity. This pus burrows and works to the surface through the skin or into some natural cavity of the body. The pus may burrow long distances from its place of origin. The cavity containing the pus is surrounded by an inflamed and thickened area which does not contain matter. The pus may in time be dried up if it does not find an outlet, but usually a cure is only effected after the matter is discharged. In most cases abscesses are due to the presence of micro-organisms. They may be acute or chronic.

Treatment.—When pus threatens to form give a brisk saline purge, as Epsom salts and of quinine two 5-grain doses in the day. Apply hot poultices every two hours, which will cause the capillaries to dilate and relieve the congestion. If suppuration has already taken place, warm poultices and hot fomentations hasten the formation of matter. When this is fully formed, then open the cavity by an ordinary bistoury. If the skin above is frozen by means of ether, no pain will be felt in the incision. (*See* p. 127.) This effected, wash the cavity with carbolic acid 2 tablespoonfuls and water 80 tablespoonfuls, or corrosive sublimate 5 grains to water 80 tablespoonfuls. If there is still great pain, apply hot poultices well sprinkled with boracic acid or iodoform.

Anus, Fissure of the.—This is a crack, or a superficial ulceration, at the verge of the anus, between the skin and the mucous membrane, extending within the bowel. There is intense pain during the act of defæcation and it may be for hours after.

Treatment.—If of long standing it must be treated by a surgeon ; if not, touch with nitrate of silver and allow it to heal. But something must be done for the agonising pain that comes on after defæcation. The following ointment should be rubbed on the fissure twice every day after washing the part with cold water : hydrochlorate of cocaine 30 grains, water 1 teaspoonful, lanoline ointment 2 tablespoonfuls. This preparation paralyses the small nerves in the skin.

Anus, Itchiness of the.—Find out if it is caused by worms or cracks, or piles, and treat these. It is, however, often due to a morbid state of the nerve-supply, in which case it is necessary to attend to the general health. Give iron tonics, and let the sufferer take a change. An ointment made of carbolic acid 1 teaspoonful, lard 4 tablespoonfuls, and camphor 1 teaspoonful is often effectual. Or the parts may be dusted over with carbonate of bismuth. The following too is good : hydrate of chloral 2 teaspoonfuls, water 20 tablespoonfuls. Avoid all scratching.

Bubo is an inflammatory swelling of the glands of the groin. Here we will speak of it as a hard and sometimes suppurative state of the glands of the groin, coming on after a venereal sore of the genitals.

Treatment.—Attend first to the venereal sore on the penis. If the gland in the groin is only swollen and sore, with no pus, then, in order to prevent the formation of pus, moisten the skin over the gland with a little water and rub it freely with solid nitrate of silver. Give absolute rest to the part by resting the limb. Another excellent way is to paint the skin over the gland with iodine 2 drachms and carbolic acid 4 tablespoonfuls. If the pain is of a stinging character with great redness, we conclude pus is forming. In this case apply a good large warm moist poultice. When the matter has formed, after the application of a few warm poultices, freely open the sore and let out the poisonous pus. Take away every shred of dead matter and skin, and wash thoroughly with perchloride of mercury 1 in 1000 and fill the cavity with warm iodine ointment or the above iodine and carbolic acid. Then treat as an ordinary ulcer. It is sometimes absolutely necessary to attend to the general health.

Bunion is an enlarged synovial sac situated on any part of the foot, but most commonly at the root of the great toe or of the fifth toe. There is often some distortion of the foot. These enlarged synovial sacs are usually due to badly fitting boots. In some cases a bunion is hereditary, beginning as a tender spot on a prominence that has been exposed to pressure. In course of time the natural

bursa becomes fuller than normal ; this may suppurate or become the seat of corns.

Treatment.—Remove the cause, such as badly fitting boots. Paint the inflamed part with liniment of iodine, and it will be followed with good results.

Chapped hands.—This is a form of inflammation of the back of the hands characterised by a dryness of the skin together with cracks of the same. It is due to cold affecting skin that has not been properly dried, and is often brought on by drying the hands with damp towels and holding them before a fire.

Treatment.—When washing the hands be careful to dry them thoroughly with a warm towel. Rub the following ointment on the hands night and morning : lanoline 4 tablespoonfuls, hydrarg. ammon. chlor. 25 grains, liquor. carb. deterg. one and a half teaspoonful. Glycerine 2 parts and eau-de-cologne one part are excellent.

Chilblains are localised inflammations of the skin, seen in cold weather, mostly on the hands and feet. At first they are red ; but later on they become purple in colour. They are often very painful, especially when they have been chilled and are being heated again.

Treatment.—When the sore first makes its appearance, rub it well with compound camphor liniment, or the following : liniment of soap 6 tablespoonfuls, chloroform 1 teaspoonful, liniment of belladonna 4 teaspoonfuls. Oil of eucalyptus is good. If blisters form, puncture so as to allow the water to escape, and dress with the following : zinc ointment 2 tablespoonfuls, compound tincture of benzoin 2 teaspoonfuls, lanoline 2 dessert spoonfuls. If an ulcer forms, dress it like any other ulcer. Take good exercise in the open air and attend to the general health.

Corns and callosities are due to intermittent pressure produced by tightly fitting, or badly fitting, boots. The corn may be due to too large boots causing the skin of the foot to be intermittently irritated.

Treatment.—Pare the corn with a sharp knife, and if it cannot be cut out, by means of a straw or a match let a small drop of glacial acetic acid fall on the spot. Salicylic acid, if rubbed into the tissues of the corn, is most effectual. In soft corns between the toes, separate the two opposing surfaces with a very little bit of felt in which a small hole is cut. Into the hollow put a little salicylic acid.

Cramp means a muscular contraction which is involuntary, irregular, and variable. It affects the muscles of the calves most frequently.

Writer's cramp.—In this the sufferer can use the hand in the most delicate manipulation, but as soon as writing is attempted the muscles called into play refuse to act, or do so in a sporadic manner.

Bather's cramp.—In this case the bather is seen suddenly to throw up his arms and sink. This form is believed to be more a failure of action of the heart than of the muscles of the legs. When a swimmer, out of practice, plunges into cold water the strain on the heart is very great, and may prove too great. No one who has not been practising should attempt a long swim in cold water, and those with weak hearts should be most careful to avoid fatigue in swimming. This is the explanation of some serious illnesses that have seized bathers in mountain streams in Africa. No one in Africa should bathe in a lake till the sun is well above the horizon (say eight o'clock), and on no account should one ever bathe in a mountain rivulet, as the temperature of the water in these streams is often very low.

Treatment of cramp.—Let the limb be rubbed upwards briskly with a towel. By a voluntary action let the muscles be thrown into full prolonged play. It is said if an elastic band or a strong cord be tied tightly round the calf, the spasm will cease. If it comes on when the person is lying down, let him immediately endeavour to rise up.

Foreskin, inflammation of the.—This often occurs in young African boys who have long foreskins, and where the natural secretions are not washed away, and ordinary cleanliness observed.

Treatment.—Draw back the foreskin, and several times a day wash the parts thoroughly with warm water, and dust with equal parts of boracic acid and starch. If the foreskin tends to contract so that it cannot be drawn back, then circumcision must be performed. If the inflammation has affected the prepuce on the surface of the glans penis, then the sores must be touched with nitrate of silver, or nitric acid, or pure carbolic acid, and covered with a piece of dry lint laid between the glans and the foreskin. If the foreskin is contracted in such a way that it cannot readily be drawn back, then take a small syringe with a little warm Condyl's fluid, or warm, weak, corrosive sublimate (1 in 1000), or nitrate of silver (1 in 100), and wash the parts thoroughly, putting the nozzle of the syringe under the foreskin, and injecting the fluid so that the skin is stretched gradually; then by exercising gentle pressure endeavour to draw back the relaxed tissues. If the inflammation is due to a gonorrhœa, then syringe with permanganate of potash 1 grain to 4 tablespoonfuls of water. If there is much pain apply

lead and opium. If there is a chancre, or a sore of any kind which you cannot get at, do not hesitate to slit up the foreskin on its dorsal aspect, and treat as for chancre or syphilis.

Gleet is a chronic impure discharge from the mucous membrane of the urethra which may last for months or years. It usually has its origin in a gonorrhœa, and is a most troublesome disease to treat.

Treatment.—Always begin to treat it as if it were an ordinary gonorrhœa, but if it has lasted for many months the ordinary remedies for gonorrhœa will be useless. First, then, look to the general health. Remove constipation, dyspepsia, anæmia. Stop all stimulants, tobacco, spirits, over-eating, and indulgence of every kind. Avoid pickles, beer, &c. Give Easton's syrup in teaspoonful doses three times a day, with 3 grains of quinine and 15 drops of the tincture of iron at the same rate. In order to act on the urethra, give 10 grains of boracic acid in water every night.

As a local remedy pass a solid silver or plated sound with a wide curve into the urethra. Lubricate the instrument well with glycerine, and allow it by its own weight to slip into the canal. Begin with a small instrument, and go on to a No. 12; leave it in the canal at first for a few minutes only, but the time should be gradually lengthened. Do this three times a week, and it will stay any tendency to stricture. The following are good lubricants to rub on the sound in order that they may be carried down the canal to the seat of the ulcer: iodoform, 30 grains, mixed with glycerine, 2 tablespoonfuls. Antinosine, being odourless, may be preferred to the iodoform. All kinds of bougies and injections have been used. Blisters, or counter-irritation to the perineum (the skin in front of the anus), have been used with great effect.

Gonorrhœa is the name given to a muco-purulent discharge from the urethra or vagina, which is a contagious poison. If this muco-purulent discharge be examined microscopically the *diplococcus gonorrhœa* will be seen in considerable numbers. This is the low form of life which sets up the disease. The affection is usually brought on by the direct communication of the unaffected with those already suffering, and is one of the many penalties attending impure intercourse between the sexes. It is a very acute and painful disease, attended with severe itching, redness of the parts, and swelling. At first the name gonorrhœa was given under the belief that the discharge was really the spermatic fluid; it is now known to be a muco-purulent discharge from some inflamed part of the mucous membrane of the urethra. The disease may reach its height in from one to three weeks, and then gradually subsides. An

old heathen long ago said, "Truly the gods make scourges out of our pleasant vices."

Treatment.—In the early stages, when pain and uneasiness manifest themselves, and there is a history of exposure, begin by giving a mild purge daily, say 4 teaspoonfuls of Epsom salts; wash out the urethra with warm permanganate of potash 1 grain to 10 tablespoonfuls of water. Inject most thoroughly, and do it every three hours. Twice a day take a warm bath. When the discharge begins to get less, use double the amount of permanganate to the same amount of water. When using this drug rest in bed if possible; take only milk and eggs and light corn-flour puddings. Discard for a day or two tobacco and animal food, and on no account imbibe spirits. Give large drinks of potash water with a lemon squeezed in it: this forms citrate of potash in the urine, which acts soothingly on the inflamed mucous membrane.

When there is great pain and swelling in the penis, and fever in the system, let the sufferer take very hot baths, and while in the bath inject hot water into the urethra. If the penis is painfully erected and twisted (chordee), while in the bath take a warm enema and wash out the bowels, and take the following: bromide of potassium 20 grains, chloral 10 grains, camphor 5 grains.

When the fever and pain have subsided, the stage is reached in which astringents should be pushed. Of all the host of drugs recommended, copaiba, notwithstanding all its disadvantages, is the best. The following is an excellent preparation for Africa: cubebs in powder, 2 ounces, nitrate of potash, 2 drachms, Dover's powder, $\frac{1}{2}$ drachm, balsam of copaiba, as much as required. Of this take about the size of a small marble in cigarette paper three times a day, two hours after meals.

Continue all the time the injection of warm permanganate of potash (1 grain to 10 tablespoonfuls of water). It may even be used up to the strength of 1 grain to 2 tablespoonfuls of water. Never use it cold, but about the temperature of the body, 99° F.

After passing urine wash out the urethra with pure warm water, and inject the warm permanganate.

Should permanganate of potash not be at hand, then one of the undermentioned should be used in the following proportion:—

Chloride of zinc .	1 grain to 2 tablespoonfuls of warm water,		
Acetate of lead .	3 grains	"	"
Iodoform . . .	10 "	"	"
Alum	3 "	"	"
Tannin . . .	5 "	"	"
Boracic acid .	10 "	"	"

The most recent medical literature points to the following treatment of this disease : a 1 or 2 per cent. of ichthyol is injected into the urethra till the passage is distended. The injection should be used three times a day. This drug is antiseptic, is painless, and keeps down the fever. Creasote, in the strength of 2 to 10 drops to the thousand drops of water, is very highly spoken of also.

This disease in females should be treated on exactly the same lines, only before using the injection all the canals should be washed out thoroughly with two or three tumblers of warm water, with, say, a tablespoonful of alum, and the same of borax dissolved in it.

Hæmorrhoids or piles are little tumours found at the very edge of, or just within the anus, where the skin and mucous membrane meet. They originate in the veins of this region, and at their maturity consist of folds of skin or mucous membrane with infiltrated and hardened tissue. Sometimes the knot consists of little clusters of dilated veins which can be easily emptied by pressure. In others the blood coagulates in the veins, forming little hard knots. Some piles bleed profusely, others do not bleed at all, or only to a trifling degree. The patient suffers for a long time from a feeling of heat, and fulness, and dull pain at the anus. He feels as if a something were in that region that should come away. On examining, he feels a little tumour about the size of a marble, which may be soft or hard, and may be inside or outside the anus. In time this grows as large as a walnut, and other tumours grow round it. If it is not inflamed it gives little annoyance, but it is apt to be irritated by the fæces, or stagnation in the blood-flow may be set up. It is exquisitely painful to the touch, and constantly stinging. It is specially acute in women. In severe cases the sufferer can neither stand nor sit, and finds relief only when lying down on the flat.

Piles are brought on by anything which causes a congestion of the lower bowel, as constipation, high living, sedentary life, and affections of the bowel which hinder the return of blood from the fundament and rectum.

Treatment.—Before treatment for hæmorrhoids is sought, they have usually been present for years, being known as “attacks of piles.” The veins have been varicose for years it may be, but constipation, excess in food, or a severe wetting has increased the congestion and brought on an attack. This is the usual history. In order to prevent piles it is necessary to take plenty of exercise in the open air, to wear warm clothing, and to avoid cold and damp. Constipation is very injurious, and should never be tolerated. In such cases a tablespoonful of pure olive oil every morning after breakfast is

excellent. Straining at stool, too, is sure to be injurious. Whenever the "piles" have come down after a motion, wash them carefully with cold water and push them up into the bowel. In such a case never use paper but the softest sponge. The muscle which constricts the bowel often tends to strangle the piles and sets up much trouble. Should one have occasion to fear the coming of piles he should twice every day inject a teacupful of warm water into the bowel, and before he goes to stool should inject two more teacupfuls.

When the piles are inflamed and stinging, by the jerky contraction of the constrictor muscle of the bowel, let the sufferer sit down on a chamber half filled with very hot water, and let the lips of the anus be steamed thoroughly. Then inject, say, two or three cups of the same hot water into the bowel, and wash it out thoroughly. Then let the sufferer rest in bed in the horizontal position, and apply hot fomentation cloths with belladonna or opium sprinkled over the same. A 5 per cent. solution of cocaine gives relief.

When the piles are very much inflamed and indurated they must be removed by a surgeon.

Hydrocele means a dropsy into the serous membrane which invests the testicle. It is usually a painless, pear-shaped swelling, which only causes uneasiness from its weight. The natives are very subject to it. It may come on as the result of inflammation, or without any apparent cause. It is seldom seen before middle life.

Treatment.—It should be tapped by a moderately sized trocar and canula, and some strong tincture of iodine injected to inflame the membrane and bring about a radical cure.

Joint affections.—Wherever there is any tendency to affection of the joints, the first thing to do is to attend to the general health. Get healthy surroundings, good food, and improved nutrition by cod-liver oil, malt extract, &c. Tonics, as iron, arsenic, quinine, are on the right lines.

Let the joint get absolute rest. If it is large, let the sufferer rest in bed till the inflammation—as pain, redness, heat—passes off. *If pain is great* use warm fomentations, hot poultices, &c.; or make a spirit lotion of rectified spirits 1 part and water 2 parts, soak strips of lint in this and strap the joint. Cover the whole with a thin mackintosh or oiled silk; this will relieve the pain. If the part is very red and the small vessels throbbing, then a few leeches will do good. *If abscesses are present and pointing* they should certainly be freely opened as the pus is a poison. Use every anti-septic precaution.

Synovitis is the inflammation of the synovial membrane, which allows the free gliding of all integuments in or surrounding a joint.

In the acute affection absolute rest must be secured, and if possible leeches applied to the joint, then to secure continued bleeding apply hot fomentations. Give 4 teaspoonfuls of Epsom salts to act on the bowels. When suppuration occurs only a surgeon can deal with the case.

Wounds of the lung, as by spears, bullets, &c. Never probe for a bullet. If the spear is broken in the wound pull it out with all possible antiseptic care. Put on a large pad of gauze, and bandage moderately tight, and this will give relief. Order perfect rest, with the sufferer lying upon the wounded side.

Inflammation of the nail—Onychia.—This affection often gives a great deal of trouble and annoyance. In treating it use carbolic lotion made from 1 teaspoonful carbolic and 8 tablespoonfuls of water. Let lint be soaked in this, and wrapped round the finger, then envelop in oiled silk or guttapercha tissue, and tie firmly at the distal end to keep the moisture within. If the pain is very great use chloral 10 grains and 2 tablespoonfuls of water; or iodoform may be dusted over the part. If the nail is destroyed, remove it and dress the matrix.

Necrosis—death of bone.—This is the death of bone, but is usually restricted to those cases where a piece of the shaft of a long bone dies, and is enclosed in a layer of new bone. *Exfoliation* is the death of a thin superficial layer of bone. *Caries* is the death of the more cancellous or soft bone.

Treatment.—Endeavour to trace out the cause, as syphilis, and treat it. If struma, then treat it. When abscesses form we must open them, and remove the purient matter. Often matter forms under the periosteum (membrane round the bone), in which case it must be freely and deeply opened. This is about all that can be done—*rest, feeding*, opening of abscesses, and special remedies directed against the causes.

If the exfoliation is seen remove it; if the dead part is near the surface remove it also, and plug the hole with iodoform, and treat it most carefully with all antiseptic precautions.

Orchitis, or inflammation of the testicle, may arise from many causes. It is sometimes, by metastatic action, set up in an ordinary course of malarial fever (*see* p. 83). I have known of this taking place on three occasions.

Treatment.—What is most needed is rest in bed, in the horizontal position, and on the broad of the back. Put a small board between the thighs, and rest the painful enlarged and inflamed testicle on this. It is not always possible to rest, however, in which case the inflamed organ must be supported by bandages. Get a good

sized handkerchief, and tie it round the waist. Get another, and tie one end to the back of the above girdle, and the other end is brought through between the limbs and tied in front. By this means the testicle will be well supported. At the beginning of the treatment give a full dose of Epsom salts, 4 teaspoonfuls, or other saline purge. Forbid all solid foods, and let the patient take only milk diet. Cold water cloths applied to the organ are good ; but, it may be, that hot fomentations applied every hour, and covered with a thin mackintosh, will give greater relief.

If the pain is almost unbearable, leeches will give relief, or painting the organ with nitrate of silver 1, to water 6 parts, will alleviate the suffering.

If suppuration is present, free incision under the most careful antiseptic treatment is indicated.

Prolapsus ani.—This is a protrusion of the bowel through the anus. Here, obviously, the first thing to do is to push the bowel back within the grasp of the sphincter. This is done by putting the tips of the fingers of one hand together, and pushing the protruding mass into its place ; or, it may be necessary to oil the fingers and push them beyond the mass into the bowel, and so slip the whole in. This done put a pad of lint over the anus, and strap the whole firmly. Another very good way, in order to prevent the prolapse (for it usually comes on while at stool), is to inject, previous to a motion, by means of a glycerine syringe, about 2 tablespoonfuls of glycerine in a cup of warm water. Let the motion be made while the patient lies on the side, and afterwards inject half a cup of cold water into the bowel. This water may be ejected in a short time. It is absolutely necessary to attend to the general health, and, as it improves, in most cases, the prolapse will gradually become less.

Retention of the urine.—Here the patient is unable to expel the urine from the bladder. It is due to many causes, as weakness of the system, nervousness, inflammation of the urethra, stone, stricture. There is usually great desire to pass urine, but, notwithstanding all the straining, an inability to do so. In old persons the bladder may be enormously enlarged.

Treatment.—Let the patient strip, and get into a very hot bath, and, while lounging in the water, endeavour to relieve the distended bladder. Again, if it is due to a stone in the bladder, the urine may flow if the patient lies on his back, or rests on the hands and knees. If this does not occur then a catheter must be passed into the bladder. This instrument is a hollow tube made of silver or rubber or other material. Catheters are known by their numbers, the

smallest English size being a No. 1, and the largest a No. 12. In passing a catheter the greatest of care and patience is absolutely necessary. On the whole the silver instrument is the best. Let the patient lie in a hot bath for about ten minutes, then take a No. 10 catheter, rub it briskly by means of a towel and glycerine, so that it is about the temperature of the body ; this done, insert it into the urethra, and gently push it on. When the prostatic region is reached, manipulate perseveringly.

It may be necessary to tie the catheter into the urethra for a few days, during which time the patient should lie in bed.

If it is impossible to empty the bladder, then, in order to relieve the sufferer, the bladder may be tapped by the aspirator above the pubes. This, however, must be performed by a surgeon.

Patience, hot baths, a No. 2 gum-elastic catheter, and even chloroform will often work wonders in a case of this kind.

Rupture or hernia signifies a protrusion of any organ through its natural covering. This may happen in any part of the body. It is, however, usually restricted to a protrusion of any of the abdominal viscera through a natural or forced opening. If we take into account the pressure in coughing, &c., to which the organs in the abdomen are subjected, together with the looseness of the various viscera, and the weaknesses of the walls, we can easily see how a hernia may occur. These herniæ may be congenital, from a natural weakness in the walls, or they may arise from the exercise of some abnormal pressure. In the proportion of 1 to 4, men are more subject to rupture than women, although the femoral herniæ are most seen in women. Herniæ at the umbilicus are very common amongst the Africans, due to the carelessness in attending to the umbilical cord at the period of birth. Every hernia has a covering of skin, then fat, then the lining membrane of the abdomen which is forced on by the bowel or other organ. The bowel (usually the small intestine) forms the contents of the sac, but there is usually, along with the bowel, a quantity of secreted fluid.

Some herniæ are reducible, in that they can be pushed back into the abdomen ; others cannot be so reduced, but go on growing larger ; while others again become adherent to the structures over them. Some may be blocked up by indigestible food (as cheese) or hard fæces ; others may become strangulated, by the opening through which they originally came being closed up.

Treatment.—This is too large a subject for this book, but a word may not be out of keeping with the object of our writing. If the hernia is recent, try to reduce it and keep it reduced. Lay the sufferer in a horizontal position in bed, with the head low and the

hips raised a little, when the hernia may slip in of itself. If not, grasp the tumour by the whole hand and gently roll it, as in a circle, and it may slip in. Then put on a pad, large and firm, with a tight bandage in the figure-of-eight fashion. If a good fitting truss is to be had, it is the best of all.

If the hernia cannot be reduced, but does not give any great inconvenience, then it must be carefully protected by a bag suspender. A bag-truss is best. The bowels must be most carefully studied, and always kept loose. No indigestible food, as cheese, should be taken, as such an irreducible hernia may suddenly manifest signs of the stoppage of the natural motions. The hernia, in such a case, becomes hard and inflamed with twisting pains, sickness, and vomiting. On coughing an impulse can be felt, however. Here let the sufferer rest with the hips raised on a pillow. Give only cold water to sip. Give a full dose of castor oil to increase the natural motion of the organ. After twenty-four hours give a warm water enema, and try if the motion will come.

If the hernia is hot and inflamed, the patient may have some fever, vomiting, and be generally uneasy, yet on coughing an impulse is felt; in such a case we conclude the sack itself is all right, but the natural motions through it are stopped. Continue the rest in bed. Give milk only as food. Apply hot fomentations to the part. Give a full dose of castor oil. Give $\frac{1}{2}$ grain morphia to relieve the pain. Try the warm-water enema. As soon as the patient gets a motion a great change will be felt in the tumour, as the pain and inflammation will subside and the tumour will be soft. By grasping the tumour in the hand try and reduce it as a whole.

Last of all the bowel may be strangulated. Here the neck of the sac has grasped the protruded bowel and stopped the circulation. This is most dangerous, and can only be touched by a surgeon.

Sprains or strains designate a violent stretching, and it may be, rupturing of the binding fibrous ligaments that are found around joints, together with, it may be, rupture of some of the small blood-vessels, and a consequent extravasation of blood underneath the skin. In severe cases muscles and tendons in the neighbourhood may be torn asunder. Such sprains are very common in the wrist and the thumb. In the lower extremities the ankle suffers most. A severe sprain of the ankle may be mistaken for a fracture, and in a serious case both may be present. Sometimes the swelling is so great, and the pain so acute, in one or two spots, that it is difficult to say what exactly is wrong. Sprains of the knee are common, and are manifested by great swelling in the knee-joint. Sometimes too the back is seriously strained. The symptoms are

a sharp stinging pain immediately after a slip or other accident. It may be that a feeling as of something cracking and giving way is felt. Then soon after this sensation there is swelling, and in a few hours the part becomes blue.

Treatment.—If seen immediately after the accident, and before there is much swelling, put on a bandage somewhat tightly, and constantly apply cold water over the bandage. If the bandage becomes unbearably tight and unpleasant, take it off, and put the limb into as hot water as can be borne. This is the treatment to apply after the swelling, and other symptoms, have manifested themselves. Absolute rest is a necessity. Put on strips of lint soaked in rectified spirit 1 part and warm water 4 parts, and cover it with oiled silk or a thin mackintosh, or hot fomentations continued for a few days are good.

Some recommend that sprains should be treated from the very first by pressure. This may be done by strips of plaster being put firmly and neatly round the whole joint; or the part may be enveloped in cotton wool, and a bandage firmly applied. The limb must be allowed to rest until the pain and swelling have subsided. If there is a tendency to stiffness, rub the joint twice a day with sweet oil, and exercise the part, manifesting the greatest of care.

It is well to pay attention to sprains, as they are often the origin of serious after trouble.

Varicose veins are veins which are preternaturally enlarged without any apparent physiological reason; some veins are never so affected, while others are universally involved. Varix is of common occurrence in the sub-mucous veins of the rectum, constituting piles; others occur in the spermatic veins, giving rise to varicocele; others in the lower limbs, constituting ordinary varicose veins.

The affection is seen most in those persons who are of a slow indolent temperament, with weak health, and who also suffer from the walls of the veins being lax. Some families seem to have a hereditary tendency to this affection. If any member of such a family should have an occupation in which much standing is involved, he is likely to suffer from this affection. If the liver suffers from a disease, in which the organ is contracted, it will impede the circulation through it, and cause a stagnation of the veins below. So too with the heart: if it is weak, it will be unable to propel the blood against gravity, and so the circulation in the lower limbs is sluggish.

Garters compress the veins, so too does the hard fæces in the lower bowel in constipation.

Treatment.—Support is the treatment called for in affections of the leg. Do this by an elastic webbed bandage. Let this bandage be put on the leg in the morning before rising from bed, and taken off after retiring for the night. Avoid garters, high living, constipation, and long standing in a damp place. The curative treatment by excision or ligature can only be undertaken by a surgeon.

Warts are groups of abnormally long papillæ of the skin covered by hard dry cuticle. They are horny, and rounded off by friction. They are common on the hands and fingers, and are seldom seen on the face. Very little is known as to their cause.

Treatment.—Once a day apply, with a straw, a drop of the strongest glacial acetic acid. What is aimed at is the entire destruction of the growth. When the mass falls off, apply salicylic acid.

Whitlow is a most painful inflammatory affection of the fingers which almost always goes on to suppuration. The inflammation may only be in the cellular tissue under the skin or the nail, or it may be in the tendons or sheaths of the tendons, or deeper still, in the membrane that surrounds the bone. It is an inoculation of septic organisms which have lodged beneath the skin by the medium of some wound. There is a great tenseness and throbbing of the affected finger, and it may be fever and pus. When it affects the tendons it is very serious, as it may travel up into the arm.

Treatment.—Immerse the finger in water as hot as can be borne, and put on hot poultices covered with boracic acid or carbolic acid. A free and deep incision down to the bone is the only effectual treatment with the object of allowing the pus under the periosteum to escape. The pain of the incision can be relieved by ether. (*See* p. 127.) After the incision, dress the wound in the ordinary antiseptic way.

CHAPTER XI

THE EYE, EAR, THROAT, AND NOSE

Sty.—A sty is a small boil on the edge of the eyelid, with a hair coming from its centre. In the very early stages of the ailment, if the eyelash is plucked out, the pus that has formed will be allowed to escape, and the trouble will be at an end. Should, however, matter not have formed, but from the inflamed surface it be evident that pus will form, the following treatment will cut it short. Remove the hair, then dip a needle in pure carbolic acid, and let the smallest drop enter the hole. Never apply poultices to the eye, as they are objectionable, having a tendency to multiply the local collections of pus. If the sty is very painful hot fomentations might be used. When the pus has formed apply a few drops of cocaine, and puncture the little boil, and give free vent to the pus. Then apply a little of the yellow oxide of mercury (say 6 grains to 2 tablespoonfuls of lard). This will prevent the return of the local boils. Or make the following ointment, and three times every day rub it over the lids: cocaine, 4 grains; red oxide of mercury, 3 grains; vaseline, 6 tablespoonfuls.

Conjunctivitis is an inflammation of the delicate mucous membrane of the eye. This membrane lines the inner surface of the eyelids, and is reflected over the fore part of the white of the eye (sclerotic), and over the cornea. The part under the lids is thick, white, and very vascular, and is covered with small papillæ, which in disease are greatly enlarged, and known as granular lids. On the white of the eye this membrane is loosely attached to the tissue below. It is thinner than that on the lids, and not so vascular. On the cornea it is very thin and very adherent, and in health has no vessels.

Simple conjunctivitis is a catarrh or a "cold in the eye." The white of the eye is reddish, and there is a secretion of a gummy substance, which makes the eyelids cohere during sleep. The sufferer feels as if sand were in the eyes.

Treatment.—Never apply wet cloths or poultices. Any one of the following lotions in their respective strengths is excellent: (1) sulphate of zinc 5 grains, water 8 tablespoonfuls; (2) chloride of zinc 2 grains, water 8 tablespoonfuls; (3) boracic acid half a teaspoonful, water 8 tablespoonfuls; (4) perchloride of mercury 1 grain, water 16 tablespoonfuls. These fluids must have access to the surface of the eyeball underneath the lids. Let the patient sit on a chair with the head thrown back, draw down the under lid with the finger and the upper lid with the thumb, and place the drop at the inner angle of the eye near the nose. Then tilt the head over, so that the astringent fluid reaches the whole ball. An eye-dropper (see Fig. 26), or a glass rod, or a camel's-hair brush are all excellent for the purpose. The one thing essential is that the fluid bathes the whole ball of the eye. A short course of one of the above astringent medicines applied three times every day is sufficient. When the case does not yield to this mild treatment, evert



FIG. 26.—GLASS DROPPER.

the eyelids and with a camel's-hair brush paint the whole conjunctiva with the following solution: nitrate of silver 10 grains, water 2 tablespoonfuls. Note that the above affection is highly contagious, being usually carried by flies.

Granular conjunctivitis is an exceedingly chronic and intractable disease. It was very prevalent in the French army in Egypt in 1798, and has therefore been called Egyptian ophthalmia. It is due to the overcrowding of dwellings, want of cleanliness, smoky atmosphere in low-lying and damp localities. There are many distinct half-transparent elevations on the conjunctiva, where it envelops the lids, and these are chiefly on the upper lids. It may last for months or for years amongst the Africans. Recently a microbe has been discovered which accounts for its great tendency to spread, and suggests treatment by remedies that are fatal to low life.

Treatment.—Make a solution of the perchloride of mercury 1 grain to 2 tablespoonfuls of water, and apply this freely with a

camel's-hair brush. Put cool compresses to the eyes to keep out the light and relieve pain. It is very irresponsive to treatment.

Injuries to, and foreign bodies in the eye.—There is, in the eye, no proportion between the body that causes the injury and the pain occasioned. A wound that penetrates into the ball may cause less discomfort than the tiniest grain of sand. Lime in the eye is rapidly destructive; when this, or any other alkali, by accident enters or lodges on the ball, at once insert one or two drops of dilute vinegar to neutralise it. If some strong acid, such as sulphuric, enters, then some weak solution of soda should be dropped in, with the same object of neutralisation. After the injury insert a little oil, and cover up the eye from all light. Sometimes gunpowder, as in an explosion, enters the ball; this should be removed at once by means of a fine camel's-hair brush and warm water, otherwise it will make permanent bluish stains over the white of the ball. Should glass or stone enter the delicate eye, there is little hope of saving it. Other foreign bodies, as dust, soot, sand, flies, grass-seed, cinders, should be washed out with a camel's-hair brush. The expression "into the eye" is in common use, when referring to a mote causing irritation of the eye. By this expression it is not meant that the mote has gained access to the tissues of the eye, but that it is under or between the eyelids, or on the surface of the ball of the eye. In such a case the eye should never be rubbed by the fingers or knuckles. Rubbing no doubt gives temporary relief, but usually tends to embed the foreign body deeper in the tissues. The best thing to do, until assistance comes, is to completely close the injured eye. This act of closing the eye, in itself, sets up a flow of tears, which may wash the mote away. In washing the eye with a camel's-hair brush we are merely aiding nature, which is always washing the delicate surface with the fluid tears. If dust is not thus removed it lodges under the lid (usually the upper), and rubs the eye every time the lid is lowered in winking; this causes great pain, as the eye is very highly supplied with sensory nerves. If the dust is not removed it will set up an inflammation. Should this happen, the cause, namely, the particle of dust, is apt to be overlooked. Remove the foreign thing at once, and to do so, catch the eyelash of the lid affected and pull the edge forward; then by means of a pencil evert the lid and the foreign body will be seen. It can then be removed with a handkerchief or by the camel's-hair brush. Or the sufferer may do the following: Pull forward the upper lid with the finger and thumb of one hand, and with the other hand insert the lower lid under it so as to sweep off the foreign thing.

Another way is to lift up the upper lid and bring it down on the lower lid and rub the eye so as to cause a great flow of tears. At the same time blow the nose very freely. This blowing tends to draw off the great flow of tears by a suction action, which dislodges the irritating mote.

The ear.—The auricle, or external prominent part of the ear, often suffers from eczema. So too does the meatus of the organ. The treatment of these in no way differs from treatment of eczema in any other part of the body. For the external ear make an ointment of liquor of lead 60 drops and vaseline 2 tablespoonfuls, and apply this twice every day. For the meatus insert a few drops of the lead liquor (say 1 to 40) and this will give relief. Occasionally fill the cavity with warm almond oil, and gently remove all secretions.

Inflammation of the meatus of the ear is present when little boils or abscesses appear in the cavity. These are very common in some persons. Before the little abscess points, and while the pain is very great, counter-irritation is certainly right. Leeches may be placed on the auricle, and after they are removed apply hot fomentations to draw off more blood. Or a blister may be applied to the back of the ear. In order to relieve the excessive pain take of cocaine 1 grain, almond oil 25 drops. Of this insert a few drops, and it will give relief. An authority recommends in such cases resorcin 5 grains, cocaine 25 grains, in 2 tablespoonfuls of water. Of this a few drops are allowed to fall into the ear and then soaked up on wool. The following is directed against the low form of parasitic life which is believed to be at the bottom of this very troublesome complaint: Take of perchloride of mercury 2 grains, rectified spirit (if it is to be had) 6 teaspoonfuls, and water 6 tablespoonfuls, and apply to the inside of the ear on cotton-wool. When the abscess points it should be opened with a small abscess knife, and immediate relief will be obtained, then apply dry boracic acid and insert a little cotton-wool.

Wax and foreign bodies in the ear.—The majority of those who suffer from foreign bodies in the ear are young people, who in their play allow the thing to slip into the external ear. Some of these bodies, as peas, beans, &c., are liable to swell from the heat and moisture, and becoming fixed set up serious trouble. Living things, as insects, irritate the meatus of the ear; while little things, as beads, buttons, stones, shells, slate-pencil, cause less actual trouble but an equal amount of anxiety. There are certain constitutions which seem more liable to be troubled with wax consolidating than others. Nothing should ever be picked out of the ear by a pin or other hard instrument. A noted specialist says "the point of

a dagger in the meatus is less likely to do harm than unskilled efforts to remove it." Wax and foreign bodies are removed by syringing with warm water. A good india-rubber enema is best, and should never be introduced within the meatus, but held near. The fluid, too, should be inserted with some force, and continued for a little time. If the auricle is pulled upwards and backwards, the stream will more readily get behind the hardened wax (cerumen) or foreign body, and so drive it out. Should the wax be very hard and not yield to a moderate amount of syringing, stop the operation for a day, only first insert a little oil or a solution of bicarbonate of soda, say 2 grains to a teaspoonful of water. No endeavour should ever be made to remove a foreign body from the ear which is not seen. All probing in the dark, for the obstructing thing, is highly dangerous. No one should ever "pick" the ear; it may result in the pin or "ear-pick" being driven through the drum membrane. Should the result be bleeding, and there be doubt as to whether or not the drum of the ear has been perforated, every care should be taken to prevent fluid entering the meatus. Should this happen or oil be dropped in, the middle ear is most likely to inflame and cause great trouble.

Acute catarrh of the middle ear.—This is extremely painful. It is best relieved by a few leeches applied to the auricle of the ear. When the leeches stop sucking, apply hot fomentations and encourage bleeding from the bites. Sometimes, if the case has not gone on very far, the following will give great relief: Put the nozzle of an ordinary enema apparatus well into the *nose* on the affected side, then with force inject air as the patient is in the act of swallowing a little water. By this means air will go into the middle ear, and mucus may be removed.

Purulent catarrh (or a "running ear").—Treat it first as the above, from which it cannot at the beginning be distinguished. Syringing with weak antiseptic solutions must be done twice or thrice every day. The following is the best: boracic acid 10 grains, water 2 tablespoonfuls. A stronger solution would be carbolic acid 1 teaspoonful to water 20 teaspoonfuls.

Polypi often appear during the course of a "running ear." They should be removed by forceps or a snare.

The throat.—Simple catarrh of the throat passes by various names, as *sore throat*, *ulcerated sore throat*, *follicular tonsillitis*. It is generally brought on by cold. The mucous membrane in the pharynx (*see* Fig. 4) is red and swollen. The tonsils, too, may be similarly inflamed, and through the eustachian tubes may affect the ears. Sticky mucus is seen on the inflamed membrane, and

it may be little patches of blood. When the affection of the throat becomes chronic the redness is less, but the mucous membrane contains pus. In what is known as tonsillitis there is great hyperæmia of the tonsils, extending to the roof of the mouth and the uvula. The tonsils are so seriously swollen that they may almost meet in the centre of the throat. Pus may form after a short time.

The affection usually begins as a cold, with headache and general "out-of-sortness." There is fever up to 103° F. The breath is unpleasant. The voice is muffled in tone, showing that the vocal cords are affected. If there is a severe shivering fit, we know at once that suppuration has set in.

Treatment.—Quinine should be given in 5 grain doses every four hours where there is much fever. Antipyrin acts like magic in cases such as this, affecting markedly the pain in the throat, ear, and head. Give a milk diet and strong soups, and if the subject is weak constitutionally, port and claret wines are necessary. Locally use the following gargle, which may be used also as a spray: carbolic acid 1 teaspoonful, hydrochlorate of cocaine 8 grains, glycerine of borax 1 tablespoonful, water 20 tablespoonfuls. This can be painted or sprayed over the sore throat. It is also good where there is hoarseness of speech.

If the head and throat of the sufferer is steamed in the following manner, great relief in swallowing will be obtained. Procure a large basin of boiling water, and allow the sufferer to lean over the basin and breathe the steam, while the head, shoulders, and basin are covered by a sheet. Cold compresses or warm poultices may be applied to the outside of the throat.

The chronic sore throat may be painted with glycerine of tannin (this is a teaspoonful of glycerine and a teaspoonful of tannin to a tumbler of water).

If abscesses form in the tonsils give a powerful emetic, for the abscess may burst in the act of vomiting, and so do great good. Sometimes it is imperative to open the abscess by means of a sharp-pointed bistoury. Before making the incision, paint the tonsils with a 6 per cent. solution of cocaine.

It is imperative to attend to the general health of the patient. Order some preparation of iron, together with cod liver oil. A long sea voyage is often necessary to get up the general health.

Throat, foreign bodies in the.—Fish bones, coins, and badly masticated meat often cause trouble. A surgeon in such a case would use a horsehair probang, which he would insert into the throat, and as he withdraws it, the instrument expanding, pulls

out the intruding thing. Swallowing a large piece of bread, with water, sometimes carries the foreign body into the stomach. Where the substance is soft it may be pushed down by an elastic bougie or catheter. If this is not successful, try a smart tap on the back between the shoulders; then try vomiting, which is most successful in dislodging foreign bodies. Vomiting can be set up by tickling the back of the throat, or by giving $\frac{1}{10}$ grain apomorphia under the skin. Then a ball of thread, about the size of a marble, may be firmly wound, and having attached to it a strong piece of silk cord or string, it can be swallowed in jam and withdrawn. In the process it may dislodge the foreign body that sticks in the gullet.

If an angular thing is swallowed or a piece of glass, never give a purgative; rather give dry bread, biscuits, and hard-boiled eggs, the idea being that the glass may be enveloped in the putty-like substance, and be carried gradually along, and not cut the bowel. Coins, glass, spicules of bone, &c., often pass through the bowel without lacerating the same or causing much injury.

Foreign bodies in the nose.—Children suffer most from foreign bodies in the nose. Often in their play, without thinking, they push such bodies as beads, buttons, nuts, carpet tacks, pieces of stone, sweets, beans, pins, &c., into the cavity of the nostril. The amount of irritation occasioned depends on the article introduced. The cavity of the nose, however, is capacious, and allows plenty of room for an ordinary foreign body.

Treatment.—Try and dislodge the irritant. Tickle the other nostril by a feather, and set up violent sneezing. Snuff may be used with this object in view. If this is not successful syringe the nostril with hot fluid, causing a strong current to play on the back of the foreign body.

Bleeding at the nose.—In such a case take a small plug of lint and moisten it in a solution of antipyrin 1 to water 2, and insert into the nostril. This drug, antipyrin, is most rapid and powerful in stopping the flow of blood.

CHAPTER XII

EMERGENCY CASES

Cases of poisoning.—Poisoning may take place by a person accidentally swallowing a poisonous drug, or eating poisonous food, such as affected tinned meat. It may even be that a poison is taken with the object of destroying life—a suicide. In being called upon to treat such cases, first find out exactly what has been taken, then without loss of time cause the stomach to evacuate its contents. This may be done by tickling the back of the throat with the finger, or by injecting one tabloid of apomorphia hypodermically. This drug is most useful when the sufferer is unable to swallow. Another means of emptying the stomach is by the “stomach pump,” if it is at hand. In using this pump, let the sufferer sit on a chair with the head steadied by an assistant; then by means of the left index finger depress the tongue, and push the tube boldly into the mouth, towards the back of the throat and gullet, till the stomach is reached. Before inserting smear the tube with glycerine, or vaseline, or olive oil. Ask the patient to “swallow” the tube. The tube inserted, pump off the contents of the organ. Reverse the working of the instrument, and inject a little clean water from time to time, and so wash everything out. If you know the nature of the poison swallowed, mix a little of the antidote in the water, and inject it. If it is a case of poisoning by drink or opium, give one or other of the following emetics: 10 grains of sulphate of copper, or 30 grains of sulphate of zinc; mustard in 3-teaspoonful doses, in large cups of tepid water, is most effective; also tepid water with plenty of soap, or grease, or salt in it. The idea being to bring on nausea, and so empty the stomach.

The next thing is, knowing the poison, to neutralise it chemically, as :—

- (1) *For all acid poisons*, as acetic acid, sulphuric acid, hydrochloric acid, &c., give plenty of soap and water to drink; chalk or whitewash (taken from the wall of a house), or magnesia, are on the right lines.

- (2) *For all alkali poisons*, as caustic soda, ammonia, give vinegar and oils.
- (3) **Alcohol.** — Make the sufferer vomit promptly. Give strong coffee with a little spirits in it to drink. Put mustard poultices over the stomach. In desperate cases the soles of the feet may be plunged in boiling water, so as to cause immediate blistering. Or inject hypodermically $\frac{1}{25}$ grain of strychnine. Give hot coffee to the extent of two cups, by the bowel. Rouse by slapping with wet towels, putting cold water on the head, and forcing the unfortunate person to walk.

Vermin-killing powders usually contain strychnine in considerable quantity. *Crayons*, and such like substances, contain chromic acid, arsenic, and lead. *Fly papers* generally have some preparation of arsenic, and *rat pastes* have arsenic too, with the addition of phosphorus.

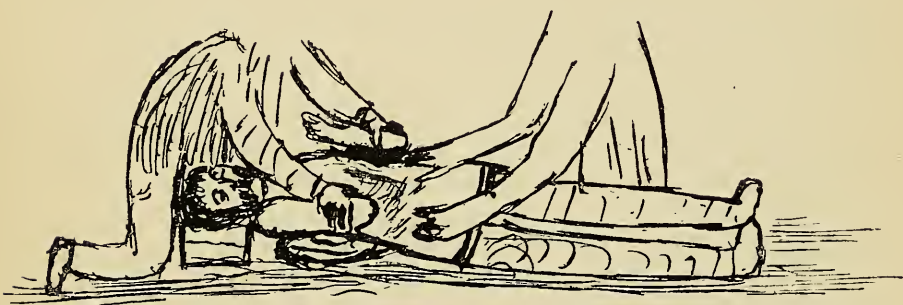
If the sufferer has collapsed, that is to say, if he is cold, stupid, or utterly prostrate, stimulants must be given either in the form of brandy or whisky, to the extent of 1 to 4 teaspoonfuls, or ammonia (sal-volatile), may be offered. Ether may be given by the mouth, or 1 teaspoonful hypodermically. Strong coffee, Liebig's extract, or bovril may be injected, while hot, into the bowel. If there is very great pain, one or two tabloids of morphine may be given hypodermically.

Cases of drowning.—When an apparently drowned person is drawn from the water everything possible should be done *immediately* to restore the natural breathing. Lay the drowned man on his back, and with a pair of scissors remove the collar from the neck and all clothing about the chest, and by means of a towel dry and rub the skin. If there should be any mud or grass in the mouth let it be removed. Look after the tongue, which will be found lying limp at the back of the throat, and by means of a pair of artery forceps, if these are at hand, draw it forward. Keep the tongue forward with the fingers, or by means of an elastic band bind it to the chin. The idea is so to fix the tongue that it will not fall back and cause choking. Turn the drowned person on his face, with his arm under his forehead, and his jacket (or other hard thing) rolled up under his stomach, press several times with all your weight, for four or five seconds, on the back, and endeavour to let the water run from the stomach and chest. This done, put him on his back again, and place the rolled-up jacket under his back, and at once begin artificial respiration after Sylvester's method. Make sure that the tongue is not in the back

of the throat, but if possible, hanging out of the mouth. If this method of restoration can be performed on a table with the far-off end tilted up so much the better, but if not, let the patient lie on the ground. The operator should kneel at the head of the unconscious person, and grasping the arms firmly about the elbows (*see* Fig. 27), bend the arms over the chest, and press firmly



ARMS DRAWN UP AS FAR AS POSSIBLE TO BRING ABOUT INSPIRATION
OF AIR.



ARMS BENT ON THE CHEST.

(The operator rests on the chest, while an assistant drives the abdominal viscera upwards towards the diaphragm to bring about expiration.)

FIG. 27.

the sides of the body. An assistant at this moment drives the viscera of the abdomen upwards under the ribs towards the diaphragm. The idea is to drive the air out of the lungs. Press the sides of the chest very firmly for at least four seconds; then quickly raise the arms above the head, drawing them out somewhat. The idea here is to draw air into the lungs. Keep the arms drawn out

for two more seconds. Again bend the arms over the chest for two seconds, pressing the sides very firmly, and again draw the arms over the head. Continue this operation without interruption about fifteen times in the minute, imitating natural breathing. While this is being done, others may apply a nitrate of amyl tabloid to the nostrils of the unconscious one, or ammonia or burned feathers, if nothing else is to be had. Others, again, may be removing the wet clothing, and drying and rubbing the limbs, applying warm-water bottles, &c. Another good thing is to throw a little hot water on the chest, and immediately after, sprinkle a little cold water, with the idea of setting up reflex inspiration—gasping. Nothing, however, is to take the place of the regular artificial respiration performed by the operator on the arms of the unconscious person, and hope should not be abandoned for at least an hour or an hour and a half. When natural breathing is set up stop this artificial mode, and continue the rubbing upwards of the limbs. Put on plenty of warm clothing. If possible put the patient in a warm bed, with hot-water bottles or warm bricks around him. If he is able to swallow, put a teaspoonful of brandy and two of water at the back of the throat, or on the tongue. When he is becoming warmer, it would be well to hypodermically inject 20 drops of ether, or 10 drops of brandy, at the same time giving plenty of hot water to drink. He should be kept perfectly quiet for at least a week, the danger to be guarded against being pneumonia.

Artificial respiration may be resorted to in cases of fainting, poisoning, suffocation from swallowing or inhalation of poisonous gas, or anything that interferes with natural breathing.

Snake bites.—In treating the bite of a snake apply, immediately, a ligature of some kind above the bite, and suck the wound vigorously for a minute. Spit out the saliva and blood, and wash out the mouth with Condyl's fluid or 1–60 of carbolic acid. If the mucous membrane of the mouth is free from any abrasion, this proceeding is harmless; it may be otherwise if there is a wound in the mouth. Cut out the bitten point and destroy the tissues in the wound with pure carbolic acid. In the majority of bites this treatment will be successful. Indians are said, immediately on the receipt of a bite, to pinch the spot up and to bite it out, or should a finger be bitten, to cut it off. This is a wise proceeding, as the venom of some snakes is remarkably absorptive. The method by which snake poison destroys life depends upon the concentration with which the venom reaches the circulation. When this concentration reaches the blood in a certain state, death may be almost instantaneous. This is often the case when small animals are bitten, or when the

undiluted poison is injected directly into the blood of a vein. It is sometimes difficult to be absolutely sure that you are dealing with a snake bite. The following, however, are signs that cannot be mistaken. *In a typical bite*, there are the marks of the teeth of the lower jaw on the skin in addition to the two distinct punctures of the fangs. In such a case there is always a history of the snake holding on to the limb, as is the case in a bite from another animal, say a dog. The tissues surrounding the bite are slightly swollen, and there is a bleeding or oozing of blood or watery matter from the actual bite. *In an incomplete bite* we may get any stage from the above typical bite, with two actual punctures, down to a mere scratching of the upper layers of skin. In recent years strychnine to the amount of $\frac{1}{60}$ of a grain every hour has been given hypodermically, so also has permanganate of potash. The medical world, however, hopes the greatest of results from the recent experiments of Professor Fraser. He found that, by injecting very small doses of snake poison into an animal (say a rabbit), it did not kill the rabbit, but that the animal gradually acquired a power of resisting the poison of even larger doses than would be injected in an ordinary bite. Not only so, but he found that the serum of this animal which had been operated upon, if injected into the blood of another animal, gave it also the power of resisting the snake poison. Both had acquired an immunity against snake poison. Still further, if the serum was injected into an animal that was likely to die of a bite, it also acquired power of resisting the poison. This serum of an animal protected against large poisonous doses of snake virum is named *antivenene*, and is now being manufactured for the treatment of all snake bites.

Bites by dogs, hyænas, &c.—Should a person receive a bite from a dog, he may be haunted by the idea of the dog having been rabid, or of it becoming rabid at some future period, and of his being seized by that awful affliction hydrophobia. When we speak of a dog being “rabid,” we mean that it is suffering from a disease characterised by a well-known series of nervous phenomena, and known as “rabies.” When a dog is seized with this disease it has a peculiar tendency to attack other dogs. The disease is due to a low organism in the blood of the dog, and when this organism appears in the blood of man, it sets up the disease known as hydrophobia. These two, *rabies* and *hydrophobia*, are distinct diseases. A dog when it suffers from rabies has no actual fear of water, but a human being has a mysterious dread of the fluid. The very presence of water sets up a series of distressing nervous symptoms. Hydrophobia is a disease in man due to a specific organism, as the result of

an animal poison, introduced into his blood usually by a rabid dog. Rabies, however, occurs in other animals besides dogs. It has been seen in wolves, jackals, hyænas, foxes, cats, horses, pigs, goats, sheep, oxen, and antelope, consequently it may be set up by the bites of any of these animals.

The poison is usually in the saliva of the stricken animal, so that the clothing offers a great means of protection against the bite. It is well to note, too, that very few excited dogs are really rabid—few indeed, and still fewer of those persons bitten really suffer from evil effects. Ordinary dog bites, as everybody knows, are extremely common, but hydrophobia is one of the rarest of diseases.

Treatment.—If the wound is a bite from an ordinary angry dog, wash it well with warm 1–40 carbolic acid, and dress it in the usual way. It is well here to mention that no subsequent illness of the dog can affect the person who has been bitten, and that consequently there is no need to destroy the unfortunate animal. It is only if the dog is rabid at the moment of inflicting the bite, that any evil after-effect can accrue.

Should you fear, however, that the dog is rabid, then *first* do your utmost to prevent the poison from entering the system. Grasp the limb above the bite, and tie on a ligature by means of a handkerchief, twisting it by a piece of stick. *Second*, get rid of the local poison. Do so by allowing, if possible, the bitten person to suck the wound, ejecting the saliva. There is no danger here, provided the mucous membrane on the inner surface of the mouth is without abrasion, or the lips not cracked. Wash the wound with Condyl's fluid and encourage it to bleed freely. Then burn the wound with nitrate of silver, or if that is not at hand burn it by a red-hot wire or poker. Others advocate the excision of the bite altogether. Sportsmen in India, on being bitten by snakes, put a little gunpowder into the wound and ignite it. This would not be unwise treatment in the present case.

Stings.—In a country such as Africa, where insect life abounds, not a day passes without people being stung. It is therefore important to know what to do in such a case. Where wasps or bees have stung, immediately apply some strong liquor ammonia. This will give instant relief. Examine the spot with care, and if the sting has been broken, and left in the tissues, by means of a pair of forceps or a watchkey pressed forcibly over the spot, the sting may be extracted. If liquor ammonia is not at hand, use a strong watery solution of ordinary baking or washing soda, and it will give a measure of relief. Oil of peppermint is also good. Carbolic acid 1 part to 8 parts of water freely applied is also on the right lines.

If the parts have been allowed to swell much, apply no ammonia, but a large moist poultice instead.

In treating a SCORPION BITE apply the above ammonia and carbolic acid, or a little chloroform laid on the spot will give relief. A recent number of the *Lancet* recommends the following very highly: Take of camphor and hydrate of chloral equal quantities, and rub them together in a warm mortar; puncture the sting of the scorpion with a needle, and rub freely with this preparation. This is also recommended to be painted on painful parts in neuralgia and rheumatism.

MOSQUITO BITES are relieved by the oil of peppermint, or by the above camphor and hydrate of chloral.

SPIDER BITES are best treated by first making a very small incision over the part, and rubbing in carbolic acid 1 to water 8. An authority has recommended the following in venomous bites of all kinds: $\frac{1}{60}$ grain of strychnine to be injected hypodermically every hour for six successive hours.

INSECT BITES are, according to the *Lyon Medical* for September 1896, best treated by a few drops of the following being placed on the bite:—

Ammonia water	. . . . .	40 drops,
Salicylic acid	. . . . .	$4\frac{1}{2}$ grains,
Collodion	. . . . .	76 „

Another prescription is the following:—

Collodion	. . . . .	$3\frac{1}{2}$ teaspoonfuls,
Salicylic acid	. . . . .	15 grains,
Benzoin	. . . . .	15 „

Should these remedies not be at hand when the bite is stinging, apply a small ligature to the finger or limb above the sting, and suck the spot with vigour. There is no danger in swallowing the poison, but it would be wise to eject it.

CHAPTER XIII

BANDAGES AND BANDAGING

THE reasons for applying bandages to a limb are various. They are applied to keep a part of the body at rest, to support the circulation of parts that are weak, to apply uniform pressure over parts that are swollen, to make compression over points that are bleeding, and to retain the dressings of a wound, or the apparatus on a broken limb. There are really only two varieties of bandages, the ordinary roller, and the handkerchief or triangular.

The roller bandage is of ordinary calico, but may be made, for special purposes, from flannel or elastic webbing. In length it is usually about 6 yards, and the rule for its breadth is that it be one-fifth of the circumference of the part of the body to which it is to be applied. In applying such a bandage, in order to keep up the circulation, always commence at the extremity of the limb, and bandage from below upwards, towards the body itself. It should cover the whole limb, and be applied with equal pressure throughout. If in a part, such as the lower limb, which is hanging, it be applied firm in one part and slack in another, swelling and pain will be occasioned where the bandage is less firmly applied. This cannot occur where the bandage is bound to the limb with gentle uniform pressure. Never bandage two surfaces of skin together, like two fingers, as the sweat and other secretions of the skin are sure to lead to irritation and discomfort. Bandage each finger separately by means of the $\frac{3}{4}$ -inch-broad finger bandage; or if the fingers must be bandaged as one, put a layer of boracic lint between each finger. In some cases, where the material of the bandage is hard and inelastic, and the skin delicate, interpose some soft material, as a closely fitting woollen sock, between the skin and the bandage. In ordinary cases, however, the common bandage may be applied directly to the skin without injury.

It is absolutely necessary, in order to keep the bandage on the limb without slipping, that both ends be secured firmly. When beginning, be careful first to bandage from below upwards, and

from within outwards ; then fix the lower end of the bandage by making one or two turns above and below the joint (say the ankle), in a figure-of-eight fashion, thus : 8. This completed, make one more turn over the foot (or limb), and gradually work up. Make it a rule never to go on till the lower end is fixed at the joint, then gradually work up, covering the part to be bandaged by encircling it so that each turn covers two-thirds of the previous turn. Always use the bandage so that the frayed edge, and not the selvage falls on the limb. In parts of the limb which get thick rapidly, it is necessary, in following out this rule, to "reverse" the bandage, otherwise it will run up the limb and leave spaces uncovered. Hold the coiled bandage loosely in the hand, while the thumb of

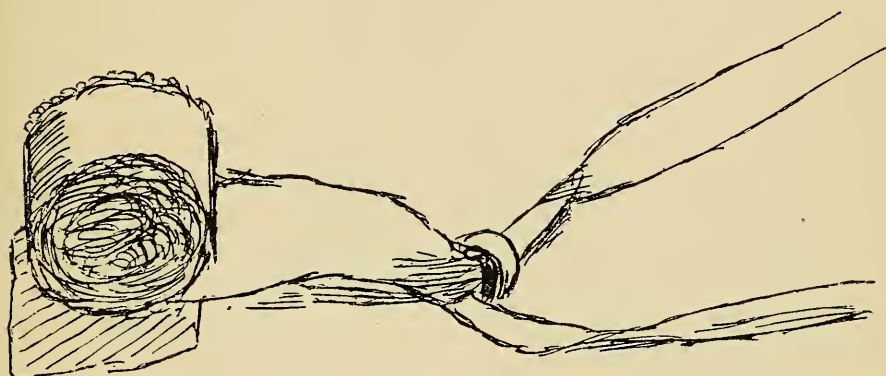


FIG. 28.—BANDAGE TORN DOWN THE MIDDLE AND SECURED BY A HALF KNOT.

(End of bandage is torn down for 8 inches, and half knotted, so that the two ends can be utilised for tying when the bandaging is completed.)

the other hand lies on the turn just made ; then make the turn of the bandage upon itself, and it will lie closely on the skin. By this means no portion of skin is uncovered, even in the most conical parts of the limb. The bandage at the top may be fastened by a safety-pin, or better still by tearing the free end down for about 6 or 8 inches, making a half knot, to save it from tearing down further (*see* Fig. 28), and by these two tails securing the limb in a loop round the leg.

A bandage for the fingers should be $\frac{3}{4}$ in. wide and 1 yard long.

"	arm	"	$2\frac{1}{2}$	"	4	"
"	leg	"	3	"	8	"
"	chest	"	6	"	6	"

In winding up a bandage, crumple up the ends into a small ball, and roll from without inwards. (*See Fig. 29.*)

When an arm or a leg is bandaged, the toes and finger tips are always left uncovered. In order to test whether or not the bandage is too tight, look at the nails of the fingers or toes; if they are dusky or very cold, and the patient complains of excessive numbness, press on them so as to drive out the blood; if the redness comes back at once, the bandage is all right, if not it is too tight, and should be reapplied. (*See Figs. 30, 31.*)

The triangular bandage.—If we take a square yard of ordinary calico and cut it diagonally from corner to corner, we will get an



FIG. 29.—WINDING UP A BANDAGE.

ordinary triangular bandage. A pocket-handkerchief cut in the same way does admirably. As in the case of the common bandage, this may be used for a variety of purposes. If we desire to fix some flat dressing on a part of the body, and so cover a large surface, the bandage may be applied unfolded. If we desire to apply pressure to a spot we can fold it lengthwise, and so gain our object. Then it can be used as a sling, rolled up thus, when it is desired to support the hand only (*see Fig. 32*); or if we desire to support the whole forearm we must apply the triangular bandage fully opened out. (*See Fig. 33.*)

In applying a sling to the upper limb it is necessary to bear in

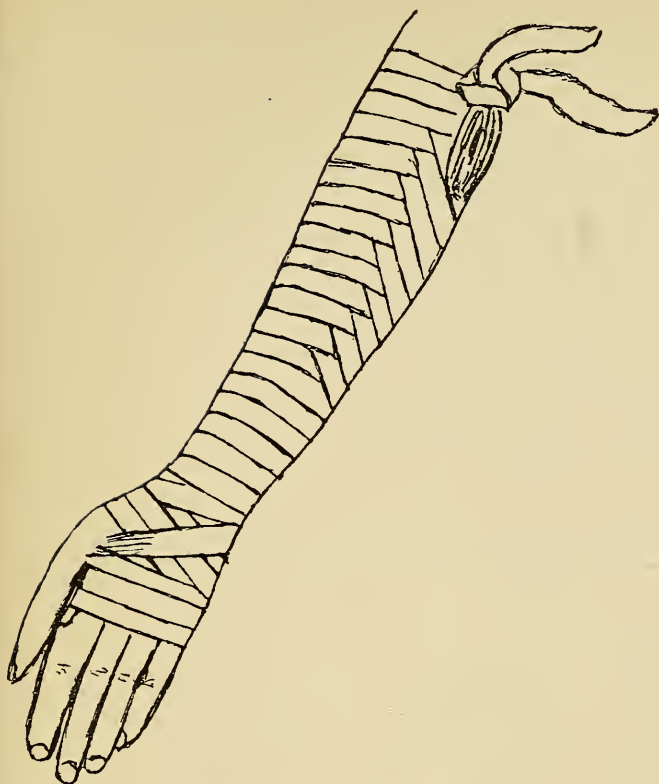


FIG. 30.—BANDAGING OF THE LEFT ARM.

(The bandage should be 4 yards long and $2\frac{1}{2}$ inches wide.

Let the patient extend the arm. Hold the bandage in the right hand, allowing the end to run below. Begin by placing the end over the back of the forefinger. Make a figure-of-eight round the wrist and between the thumb and forefinger. Then work up the limb, making reverses whenever the bandage tends to run off when you keep it closely laid on the arm. At the bend of the elbow make another figure-of-eight so as to allow the arm to bend. Finish off by one or two extra turns, tearing the end into two tails and tying.)

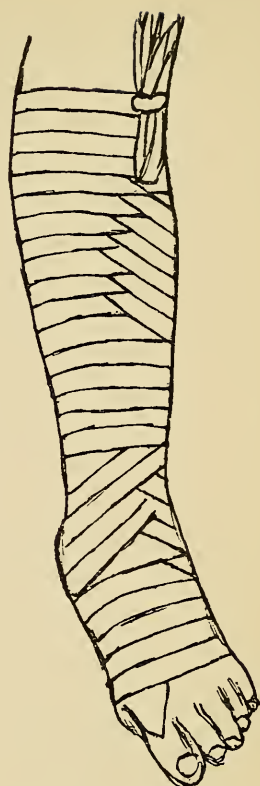
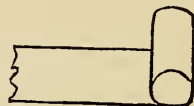


FIG. 31.—BANDAGING OF LEFT FOOT.

(Extend the patient's foot. Stand in front with the bandage in the right hand. Let the tail of the bandage run from below thus—



and place it on the ball of the great toe. Make a figure-of-eight on the ankle, and tie when finishing off.)

mind one or two details. (See Fig. 33.) The base of the triangle is always applied to the arm that is to be supported. Let the limb lie over the bandage, with the hand well up towards the opposite



FIG. 32.—TRIANGULAR BANDAGE FOLDED SUPPORTING THE HAND ONLY.



FIG. 33.—TRIANGULAR BANDAGE SUPPORTING THE RIGHT FOREARM.

(The base of the bandage is laid under the arm in the right arm-pit, and the tail over the right shoulder. The other tail is laid over the left shoulder with the arm across the chest, and enclosed by the bandage. The ends are tied behind the neck, and for neatness the loose end is tucked under and secured by a safety-pin. On no account, however, should the pin bear any weight.

shoulder. Let the base be put well into the armpit, while the end lies over the shoulder of the arm to be slung. Raise the other end of the bandage, laying it over the opposite shoulder, and let the two ends be tied in a "reef" knot, behind the neck, while the limb is raised or pulled up to the desired height. Allow the arm to rest easily, and to improve the appearance of the sling tuck the ends underneath, and secure them by safety-pins. No weight, however, should be put on the pins.

In applying the triangular bandage to support the elbow, the base of the bandage is placed in the armpit with the arm laid across the bandage and well up towards the opposite shoulder. The other end of the bandage is laid over the opposite shoulder, and as the arm is well drawn forward, the two ends are secured at the back of the neck. The angles and dependent parts are now tucked in and secured by safety-pins.

Common sense teaches us to fold and apply this bandage to quite a variety of wounds, which it is unnecessary here to enumerate in detail.

A surgeon in the exercise of his profession has many bandages besides the above, as the "looped" bandage for the heel, the "T" bandage, the "four-tailed" bandage, the "many-tailed" bandage, &c., but the above two general divisions are sufficient for our purpose.

CHAPTER XIV

FRACTURES AND DISLOCATIONS

Fractures.—A fracture is a break in a bone made suddenly, either by a blow or a twist. They are among the commonest of injuries. They may be classified as **simple** when the bone only is broken, the skin and tissues being entire, and **compound**, when, in addition to the bone being broken, the skin and tissues are ruptured, so that the external air enters to the seat of fracture, and the low forms of life find, in the weakened tissues, a nidus, and set up suppuration.

The bone may be broken transversely or obliquely, or it may be quite comminuted. On the other hand it may be only cracked, as is often seen in the bones of the skull, or bent after the fashion of a “green stick,” as is seen in the bones of very young people; or, lastly, one part of the hard bone may be driven into the softer bone. *Fractures are mostly in the long bones*, particularly in the collar-bone and the forearm-bone (*radius*) above the wrist.

The causes are usually a straight blow, a violent twist, or great muscular action.

The signs of fracture are pain on movement, unnatural swelling, deformity of some kind, as shortening, or unnatural rotation of the limb. None of these signs are to be absolutely depended upon, as for instance, there is no unnatural movement when only one of the bones of the forearm or leg is broken—the other bone may act as a splint. Usually, however, there is a grating of one bone on another. Then, on running the fingers along the bone, there is felt to be a distinct break. This, however, is only felt when the swelling is absent.

In addition to some of the above signs you will have a history, with the patient affirming that he felt a “snap” or “break” of the bone of the injured limb.

It is most important to examine the fracture of a bone as soon after the accident as possible, otherwise swelling will set in and

mask the injury. On examining the disabled limb, be careful to have the opposite limb alongside and uncovered, so that at once any difference in the contour may be detected. Move the disabled limb as little as possible, for, apart from the pain, the splinters of bone may tear the tissues, or may even pierce the skin, and make a simple fracture into a compound fracture,—a most serious calamity. If possible examine the limb where the accident has taken place. With scissors cut off the clothes, never attempting, on any consideration, to remove them in the ordinary way. Having ascertained that there has been a fracture, support the bones temporarily by means of a walking-stick, the shaft of a spear, bark of a tree, or other unbendable substance. Ordinary reeds would answer the purpose admirably. For tying, use handkerchiefs or bandages, made out of the ordinary calico found in every caravan or house. Common sense must select the best splint and the means of fixing the same. Even the temporary splints should be padded by dry grass, fine leaves, clean native cloth, calico, or other soft substance. Apply two splints well padded, one on the outside and one on the inside of the broken limb, grasping the broken bones above and below the seat of fracture, in such a way as to prevent all unnatural movement. If the injury is in the lower limb, tie the two limbs together, so that the sound one will act as a splint to the disabled member. In the case of the leg, the temporary splint (every splint indeed) should be long enough to reach from the joint above to the joint below. Usually in the case of the leg a long splint is an advantage. If the broken limb is an arm, support it from the shoulder by means of a sling, but if it is the leg the sufferer must on no account attempt to rise from the recumbent position; he must be carried on a machilla, a blanket, a native door, or a hurdle, made of long straight poles.

When arranging to treat the limb permanently, see that the patient lies on a good hard hair bed, if it is to be had. Do not let him fall into a hollow, or he will lie twisted, and so affect the after-healing of the limb. Have the bandages, splints, &c., in readiness. The splints should be lined with padding, so that when bandaged to the limb, they may offer an even pressure all over, and not unduly injure any prominence. Never put the bare splint on the limb, but pad it with cotton wool or other soft material, and with a light bandage attach the cotton to the splint. Look out for prominences of bone, and adapt the whole accurately. On fixing the limb see that the broken pieces of bone are brought together, and in accurate position. Compare it carefully with the opposite limb. The two must be the same in length and contour, making account

of course for the swelling. Next keep these broken pieces thus accurately together by the splints and bandages. This is the principle which underlies the setting of a limb.

It may be that one is not absolutely sure that there is a fracture of the bone. In such a case the rule is to put the limb up as if there had been a break in the bone, and if it turns out afterwards that you have made a mistake, no harm has been done. On the other hand, if there is a fracture, and nothing has been done to keep the bones in accurate position, untold mischief may be the result.

Common sense must fix the splints so that the bones are accurately kept in position. Do so by tying and bandaging the splints to the limb. When putting on a bandage over the splints, do not bind too tight, as this will lead to swelling ; on the other hand, the bones must be kept in accurate position. When the bandaging is complete, put the limb carefully in the position which allows the most complete relaxation of the muscles ; in other words, bend the knee a little, and put the arm in a natural position. Let the foot of the bed be raised up, say six inches or so. This completed, the less it is interfered with the better for the limb.

The healing of a fracture takes place by the broken ends being united by new bone. At first this "new bone" is soft and pliable, but gradually nature, knowing that soft bone is useless, impregnates it with bone salts, which it completes in from four to eight weeks. The older the subject of the fracture, and the bigger the bone, the longer is the healing process. If the bones have been kept accurately together, and no movement of them allowed, they will unite without any deformity ; but if not, they may heal in a crooked fashion, or not heal at all. If the health is low, or the splints have failed to keep the parts accurately together, they may be united by a fibrous tissue instead of bone, or if rest is too long continued, the healing process may not only have united the bones, but have fixed the tendons and ligaments around, by fibrous adhesions, so that the joints become stiff. We endeavour, therefore, to avoid both of these extremes.

INDIVIDUAL FRACTURES

Fracture of the collar-bone and its treatment.—This is one of the commonest of fractures. The shoulder is displaced usually downwards, inwards, and forwards. The ends of the bones can be

felt riding one above the other. Take an ordinary cotton triangular bandage, and roll it up somewhat, placing a pad of cotton in the centre. Wash carefully the armpit of the injured side with cold water and soap. Place the pad of cotton wool in the armpit, taking the ends of the bandage over the opposite shoulder, and tying them under the unaffected armpit. This will raise the arm up a little. Then take a triangular bandage, and lay one end over the injured shoulder, with the base of the bandage under the injured arm, and, of course, the upper angle away. Then bend the injured arm in such a way that the fingers touch the opposite shoulder. Raise up the lower angle of the bandage and place it over the sound

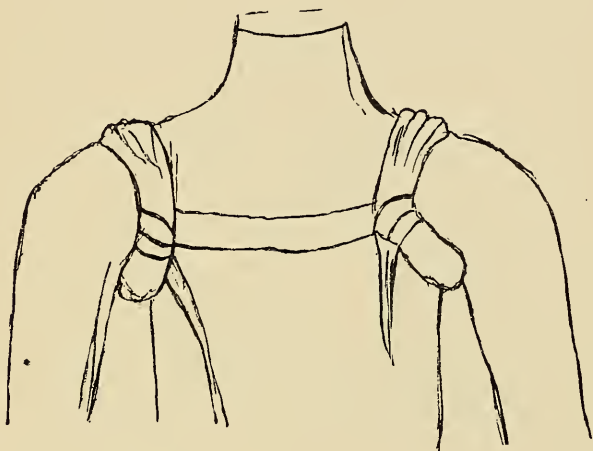


FIG. 34.

shoulder, and tie behind the neck. Pin up the hanging angle, and the bandage will support the elbow. Now bind the arm of the injured shoulder tightly to the body with a roller bandage. It would be well to sew on these bandages lest they come off. If there is a great tendency, owing to the exact position of the fracture of the collar-bone, for the shoulder to fall forward, then it would be well to tie back the shoulders by means of two loops of bandage, or two triangular bandages after this fashion. (See Fig. 34.)

Fracture of the arm-bone—the bone between the shoulder and the elbow (*humerus*). Here the usual fracture is about the middle third of the shaft of the bone, and the ends are easily recognised as riding one on the top of the other. Begin by most care-

fully bandaging the forearm from the fingers to the elbow, getting an assistant to hold the disabled arm steady. Then make a short, narrow splint to extend from the armpit to the elbow. This, however, must not go too far into the armpit, or it will inflame the part. Get a second narrow splint to extend from the front of the shoulder to the elbow, and a third from the outer shoulder to the elbow, and it may be a fourth. Let all these be well padded with cotton, and see that they are not too long, or likely to rub on bony prominences. Then adjust the splints, tying them to the arm by means of tapes or small bandages. Place the hand and wrist in a splint, but let the elbow be kept free. To do so let the angle of the triangular bandage be placed over the shoulder opposite to the injured arm, in



FIG. 35.—FRACTURE OF THE RIGHT UPPER ARM.

such a way that the base of the triangle lies to the outside, and the upper angle towards the elbow. Then raise the dependent end over the injured shoulder, and tie. It is well also, with a broad bandage, to bind the disabled arm to the body with some degree of firmness. (See Fig. 35.)

Fracture of the forearm bones.—The *radius* is the outer bone, running from the elbow to the thumb, the *ulna* is the lower and the weaker bone, running from the elbow to the little finger. Two splints should be used here, rather broader than the arm, the inner one reaching from the bend of the elbow to the wrist, and the outer from the elbow to the tips of the fingers. They are to be fixed in such a position that the thumb is uppermost; in other

words, the arm is midway between pronation and supination. Be most careful that the splints do not injure the arm at the elbow when it is bent. (See Fig. 36.) The *radius* is very often broken above the wrist, but this can only be treated by a surgeon.

Fracture of the hand and fingers.—This often occurs and is usually the result of great force. It is accompanied by much swelling and not a little pain on the inside of the broken finger. Apply a broad splint from the wrist to beyond the fingers to keep the whole hand steady.

Fractures of the leg.—These are all so serious that it is impossible for an unskilled person to attempt to do much for them.



FIG. 36.—FRACTURE OF THE FOREARM.

More harm will be done than good. A surgeon must be called at all hazards. These fractures require skilled treatment in bed, on a mattress, which should be firm, even, and unyielding. Keep the patient absolutely dry, and see that no bread crumbs become lodged on the bed, or bed-sores will be set up. Wash all bony prominences on which the sufferer lies with spirits of wine and corrosive sublimate 1 part, to water 1000 parts, and dry them thoroughly. Let this be done twice every day at least.

Fractures of the ribs are very common, and may be occasioned by blows and squeezes. The pain is very severe, and is worse if the patient should cough ; so he endeavours to keep the injured side

at rest by taking short breaths. The treatment here is to keep the broken ribs and side at rest, as far as this is possible. Make a number of strips of sticking-plaster, about two inches broad, and as long as from the spine to the breast-bone and three inches beyond. Begin to strap the side four inches below the broken rib, and continue for at least four inches above. Let each strip of plaster overlap the one below for half its breadth. Apply a broad roller bandage round the chest over all.

DISLOCATIONS

“Out of joint” is the popular designation of this affection, and is the displacement of the bones which go to form a joint. Generally it is the result of a twist or a blow, but in some cases the direct result of disease. Dislocation is a rare accident in infancy and in old age, and is most common in full manhood, say from twenty to forty. The following symptoms are seen in every dislocation: (1) the shape of the joint is different from the normal; (2) the joint is disabled—it has no power, the bones being fixed in an unusual manner; (3) the joint is very painful. The shoulder suffers more than any other joint. The appearance and shape of the joint is always altered, and usually it is greatly increased in circumference. It may be that the limb is increased in length or shortened, according to the manner in which the bones are displaced. The joint is always fixed. In a fracture we have preternatural mobility at a part which is normally fixed; in a dislocation we have preternatural fixity in a part which is normally movable. Moreover, in a fracture we have the grating or rubbing of the broken bones one on the other, whereas in a dislocation there is no such thing, but a “jamming” of the part. There is usually great pain, and in a short time much swelling of the affected limb.

Treatment.—As soon as possible, by manipulation, replace the bones in their natural positions. If this is not done, the muscles will act reflexly, and hinder the reduction of the accident. In all probability, immediately on the receipt of the accident, the sufferer will feel faint, with a cold sweat on the brow, and the whole body lax. This is the moment to seize the bones and put them right. Dislocations are generally treated best of all by what is known as *manipulation*. Here we relax the tense muscles, and try to make the wandering head of the bone go back to its natural position by

the way it came. This is easy when the patient is thoroughly under the influence of chloroform. Or it may be treated by long-continued and applied force. By this means the resisting muscles become weary and yield, and the head of the bone slips into its position. If a surgeon is present he may give chloroform or ether, and so overcome the muscular resistance. After the bones are reduced, the joint should be kept at perfect rest, otherwise they may again become dislocated. Do this by means of splints and bandages. In ten days take off the splints, and gently move the joints. Then replace the splints again. Do this daily thereafter. The idea is to allow the capsule of the joint to heal, and, at the same time, to save the joint from becoming stiff.

Dislocation of the collar-bone.—This bone may be dislocated at either of its ends. Let the operator place his knee on the man's back between the shoulders, and with a hand on each shoulder, pull the shoulders back. Put a pad of lint over the dislocated spot, and cause the shoulders to remain back by a figure-of-eight bandage.

Dislocation of the shoulder.—Here the roundness of the shoulder is gone. The method of reduction by extension is performed by the operator placing his foot in the armpit of the dislocated arm, and grasping the arm by the wrist and pulling steadily. If this fails, the arm should be swung gently round the head, when the humerus may slip into its position. The manipulation method consists in flexing the forearm on the upper arm, putting the elbow close to the side, and then twisting the forearm out. By this means the humerus is rotated. After this has been done for ten minutes or so, the arm is raised, and the humerus rotated in towards the body. It may be necessary to give chloroform in working with this joint.

Dislocation of the elbow.—Here motion of the bones one upon the other is impeded, and the relations of the various protuberances are abnormal. In treating, straighten the forearm as far as possible, and then bend the arm on the humerus and towards the opposite shoulder with some degree of sharpness, and usually the bones will slip into position. When replaced, bandage from the fingers upwards most neatly, putting a figure-of-eight on the elbow to keep the bones from slipping out again, and place the arm in a sling for two weeks at least.

Dislocation of the thumb.—This is often difficult to reduce. Tie a bandage very firmly on the displaced thumb, in order to afford power of grasping. Then force the bone of the hand (metacarpal) towards the palm of the hand. Draw back the injured

finger, and suddenly flex the thumb forwards. When it is reduced, apply a short splint to the thumb, and keep it at rest for two weeks.

Dislocation of the hip-joint.—It is usually impossible to reduce this displacement without chloroform, in which case it is imperative to have a medical man present.

CHAPTER XV

APPLIANCES AND HINTS

How to take the temperature.—The temperature is taken by the ordinary clinical thermometer. There are several varieties of these instruments, but this (Fig. 37) is one of the commonest. It is a thermometer specially made so that the mercury will run up, but will not go down unless it is forced. The scale usually runs from 90° F. to 110° F. The normal temperature of the body, 98·6° F., is usually marked by an arrow. The degrees are all plainly indicated, and the scale registered to the $\frac{1}{10}$ of a degree. In setting the instrument, it is necessary to catch it firmly at the upper part, and to give it a few sharp shakes so as to cause the mercury to go below the normal, say to 95°. The temperature may be taken in any part, so long as the instrument is kept in close contact with the body, say for a period of five minutes. It is usually taken in the armpit, but it may be taken in the mouth, or groin, or bowel. In putting it in the armpit see that the mercurial end goes well into the hollow, and is not kept from the body surface by folds of clothing. In putting it into the mouth it is necessary to know that the mouth is of normal heat, and that no cold or hot fluid has been taken for a considerable time. After the instrument has been in use it should be carefully cleaned and put into its case. As far as possible the temperature

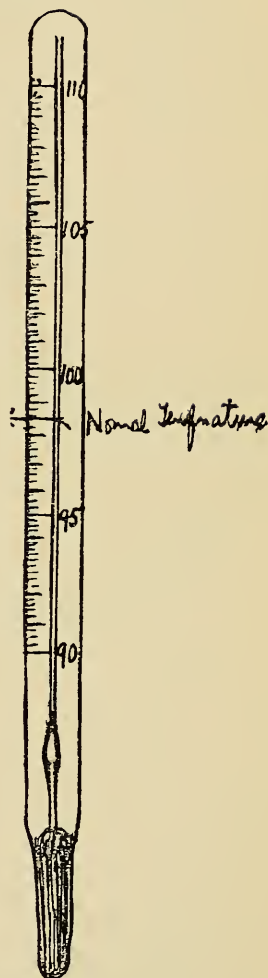


FIG. 37.—CLINICAL THERMOMETER.

should be taken at the same hour every morning and evening, when the fever extends over a period. It may even be necessary to take the temperature every two or every three hours in some forms of malarial fever.

How to give an enema.—Enema, clyster, or injection are three terms in common use to designate the introduction of a liquid substance into the lower bowel by the anus. They may be given to promote alvine discharges, to wash the delicate mucous membrane of the bowel, to give nourishment in times of great weakness, or medicine in diarrhoea or dysentery. There are three instruments in common use :—



FIG. 38.—VULCANIZED INDIA-RUBBER BALL WITH BONE NOZZLE.

I. THE VULCANIZED INDIA-RUBBER BALL, with bone nozzle. (*See Fig. 38.*) This is most useful when only about half a cupful of fluid is required to be injected, or when a nutrient soup is about to be introduced. Before injecting squeeze it well, so that the air is expelled, and only the fluid appears at the opening.

II. THE COMMON ENEMA SYRINGE, of which Fig. 39 is the most useful variety. It has a valve in the centre and a lead-sucker, which enters the fluid at one end, and a bone nozzle or long vulcanised nose at the other. This latter enters the cavity it is desired to wash. It is

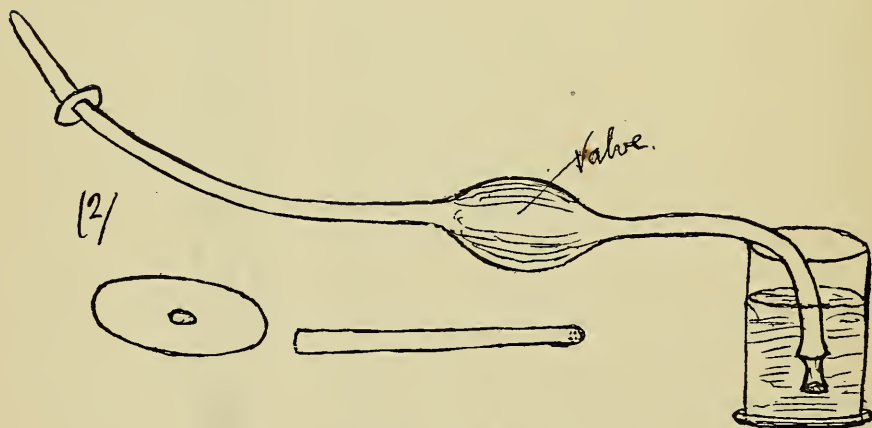
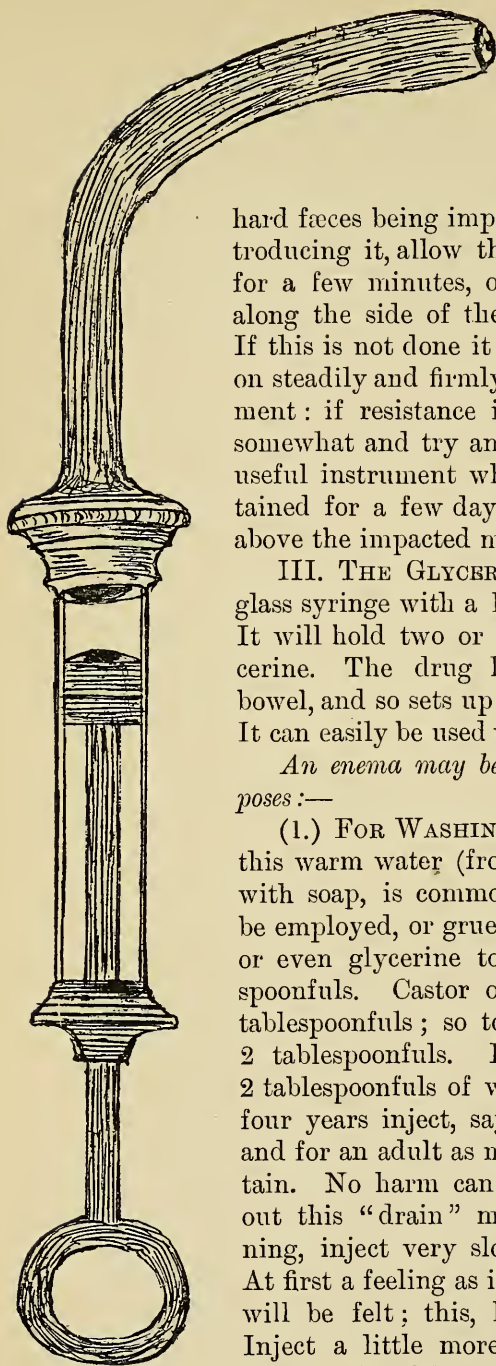


FIG. 39.—COMMON ENEMA SYRINGE.

advisable to get an instrument of the very best quality, and made of one piece of india-rubber. After it has been used hang it up by the lead end and do not coil it up in the box. Along with this



instrument there is usually supplied a long tube of about nine inches, which is used in cases where the short nose is not effective, owing to the

hard faeces being impacted in the bowel. In introducing it, allow the nozzle to lie in hot water for a few minutes, oil freely and insert slowly along the side of the bowel for at least an inch. If this is not done it will come out again. Push on steadily and firmly, but never force the instrument: if resistance is experienced, withdraw it somewhat and try another passage. It is a most useful instrument where the faeces has been retained for a few days, and it is necessary to get above the impacted mass.

III. THE GLYCERINE SYRINGE (Fig. 40) is a glass syringe with a long, curved, vulcanite nose. It will hold two or three tablespoonfuls of glycerine. The drug lubricates the sides of the bowel, and so sets up a natural action of the same. It can easily be used while the patient lies in bed.

An enema may be given for a variety of purposes:—

(1.) FOR WASHING OUT THE BOWELS.—To do this warm water (from 90° to 100° F.) alone, or with soap, is commonly used. But gruels may be employed, or gruel and oil or other lubricant, or even glycerine to the extent of 1 to 2 tablespoonfuls. Castor oil is excellent, say 1 or 2 tablespoonfuls; so too is sulphate of magnesia, 2 tablespoonfuls. For an infant inject about 2 tablespoonfuls of warm water. In children of four years inject, say, half a teacupful or more, and for an adult as much as the bowel will contain. No harm can possibly be done in washing out this “drain” most thoroughly. On beginning, inject very slowly, and wait for a little. At first a feeling as if evacuation must take place will be felt; this, however, is soon overcome. Inject a little more and wait again: by this means 2 breakfast-cupfuls may be injected into

FIG. 40.—GLYCERINE SYRINGE.

the bowel. Sooner or later the sphincter is overcome, and evacuation takes place.

The washing out of the bowel may be done by the patient or by an assistant. In such a case cover the bed with a "mackintosh," with a towel over all, let the patient lie at the edge of the bed with the knees drawn up. See that the basin with the fluid is on a chair and at the proper temperature, and that the bed-pan is near. In withdrawing the nozzle of the syringe press on the bowel with a towel, which will assist the sphincter in its contraction. No possible harm can be done in such an operation. When injecting oil, set the bottle in a basin of hot water, till it is about the temperature of the body.

(2.) FOR APPLYING SOOTHING MEDICINES, AS IN DIARRHŒA OR DYSENTERY.—In both of these diseases the lower bowel is seriously involved, and no treatment is better than that of washing the delicate membrane. If it is desired to wash the mucous membrane only (which it is well to remember may be ulcerated like any open sore), give 12 or 14 tablespoonfuls of warm water, having, it may be, a little Condyl's fluid, or chlorate of potash, or boracic acid dissolved in it. In a case of diarrhœa the disease may be treated by injecting 12 tablespoonfuls of ordinary housewife's well-made starch, having half a teaspoonful of laudanum (tincture of opium) in it. In dysentery an injection of nitrate of silver 20 grains to warm water 4 tablespoonfuls, gives great relief.

Salt injections are used for destroying thread-worms. One tablespoonful of common salt put into a tumbler of warm water or gruel, is very effective in such cases.

(3.) FOR GIVING NOURISHMENT.—There are many cases where no food can enter the system by the mouth, or where it is necessary to let the stomach and bowels have a complete rest. In such cases we must give nutriment by the bowel. It is well known that the mucous membrane of the bowel cannot, in any way, digest food like the stomach, so everything that is injected must be digested before it is put into the organ. Never give more than 3 tablespoonfuls at a time, and let the fluid be about 100° F., and of the consistency of cream. Beef-tea, gruel, milk, eggs (especially the yolk), extract of meat, or weak spirits may all be given. Prepare the food in a basin to the proper consistency and temperature, and digest it by adding a tablespoonful of Benger's Liquor Pancreaticus. If there has been intense sickness, the sufferer will be very thirsty, and will be greatly relieved if a cupful of warm water is injected into the bowel.

How to give a hypodermic injection.—The instruments necessary are seen in Fig. 41. There is the syringe itself, which

is small and made of glass, with marks on the piston to show the number of drops. The fluid is drawn in by the piston, after which the button needle is screwed on. These instruments are supplied by Burroughs, Wellcome & Co., and other makers, together with little tubes of hypodermic drugs. The drugs are made up in

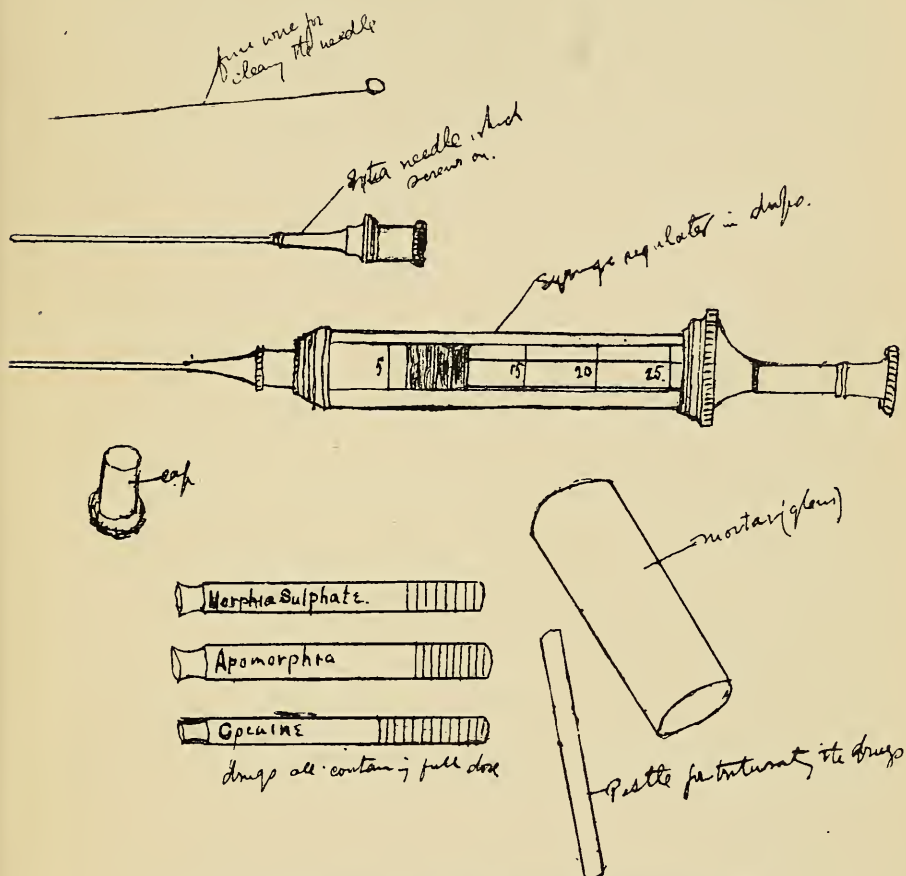


FIG. 41.—HYPODERMIC NEEDLE WITH APPLIANCES AND TABLOID MEDICINES.

exact doses, and in soluble substances. All that is necessary is to take one of the little tabloids, put it into the glass mortar supplied, add the number of drops desired, say 5 or 10, and triturate with the pestle. Then draw up the fluid into the syringe and screw on the needle. In order to fill the needle completely and expel all air, drive the fluid through the needle until a few jets escape, then keep

the needle-point upwards. An injection may be made into any tissue of the body where there are no large blood-vessels. Hypodermic medicines are usually injected on the outer side of the middle of the arm ; but the back of the elbow and the hips are good places. Grasp the skin firmly between the left forefinger and thumb, pinching it slightly, and boldly plunge the needle through the skin into the flesh below. The prick is only felt, and that very slightly, as the needle pierces the skin ; it is not painful as it passes through the tissues. Being inserted at least half an inch, inject the drug ; then lay the forefinger on the pierced spot, gently withdraw the needle, and rub the drug into the neighbouring tissues very gently. No further thought need be given to the puncture. There are two rules to be observed in this little operation. (1) Before using the syringe always run an antiseptic fluid through it, and let it lie in the same (*see* p. 121) for a few minutes ; (2) after using, wash the syringe and needle with warm water, blowing through the latter, and inserting the tiny wire to keep the button needle from being stuffed up.

How to apply hot fomentations.—These are means for the application of warmth and moisture to a local part of the body. They are very convenient, cleanly, and effective. A piece of flannel a yard square, or in an emergency a flannel shirt, is put into a basin full of boiling water ; remaining there for a few seconds it is lifted out of the water on to a towel, and two persons wring freely in opposite directions, removing as much of the water as possible. The flannel is then applied to the desired surface, and covered with a towel or a mackintosh. These, in order to be effective, should be applied every half hour, and a second one should be prepared before the first is removed. They are most successful in removing pain when they are medicated with vegetable infusions, such as opium, belladonna, turpentine, camomile, being used in almost all painful local disorders.

In giving an opium fomentation, prepare it as above, and as soon as it is wrung out of the hot water sprinkle the steaming cloth with 2 tablespoonfuls of laudanum and apply to the skin. This will quickly relieve pain.

How to apply counter-irritation.—Counter-irritation means the application of some irritant to the skin which will produce redness, and so somewhat relieve the congestion and pain in deeper parts. It is usually effected by mustard, turpentine stupes, by blisters, or by the actual cautery.

Mustard leaves are usually supplied in all medicine-chests. The leaf is soaked in water for a few seconds and applied direct to the

skin, being secured by a broad bandage. It should be kept on for half-an-hour. Ordinary mustard is made by the application of a very little cold water or vinegar, and stirred in a cup till it is of the consistency of jam. It is then spread between two layers of thin muslin cloth, and while cold applied to the skin. It is a powerful counter-irritant.

Turpentine stupes are used for this purpose. Prepare as an ordinary fomentation cloth, and sprinkle 4 teaspoonfuls of turpentine over the hot flannel and apply to the skin. Take great care that the irritation is not such as to raise a blister.

Blisters are usually very powerful agents. They so irritate the blood-vessels of the skin that a clear, straw-coloured fluid exudes from the blood, and lies between the two layers of the skin, raising the superficial one as the ordinary blister (*see* Fig. 1). This counter-irritation can be applied as "blistering ointment," or the "ordinary fly-blister," or it can be painted on as a "blistering fluid." If the ordinary cantharidis blister is applied, it should be secured by a bandage and kept on for six or eight hours. The raised-up skin, when the counter-irritant is removed, should be snipped at its dependent part and the fluid allowed to drain off, but the cuticle should never be removed, as it acts as a dressing to the part. Dust the affected part well with boracic acid, cover it with boracic lint and a layer of cotton, securing the whole by a bandage.

Tincture of iodine is a mild counter-irritant which can be painted on the skin. The liniment of iodine is much stronger and very effective.

How to dry and wet cup.—Cupping is an excellent means of abstracting blood from the deeper tissues which may be congested, and allowing it to remain in the superficial skin, or to flow off in a stream. Dry cupping is that in which the blood is drawn to the surface only; wet cupping is when the blood is withdrawn from the body altogether.

In dry cupping we can use a cup, a tumbler, or any other hollow vessel—the natives in Africa use a horn. Select a flat surface and sponge it well with warm water; then heat the interior of the vessel by holding it over a spirit-lamp, or better still by sprinkling a few drops of whisky or other spirit in the vessel and lighting it. While it is still burning apply the cup to the skin and it will stick fast, a vacuum being produced; the skin and tissues rising up into the cup are deeply congested.

In wet cupping the same manœuvres are gone through, only before applying the cup, freely make a few incisions over the skin with a lance, going through the skin only, and not into the deeper

tissues. The natives do this very frequently when they treat inflammation. When the surface bleeds, put the spirit into the cup, light it, and apply to the skin. A small stream of blood will flow into the cup and as much blood can be extracted as desired. To remove the cup, press the skin on one edge of the cup with the thumb and allow the air to go in. Thereafter sponge the wounds with an antiseptic lotion, say carbolic 1 to 30, and dress it with dry boracic lint.

If a test tube is taken, and so treated with spirit as to exhaust the air, and applied over a spot that has been scarified, an artificial leech will be the result. As much blood as desired can be withdrawn in this manner.

Starch and how to make it.—Place in a basin 1 tablespoonful of ordinary starch and 4 tablespoonfuls of cold water, and mix thoroughly till it is of the consistency of cream. Then add boiling water, and stir briskly till the whole is of the desired consistency.

Poultices and how to make them.—A poultice is an admirable means of applying heat and moisture to any surface of the body. In hospitals linseed meal is preferred to all other substances, but oatmeal, brown-bread, starch, native flour, are all admirable in their own way. Let the poultice be made of well-ground flour free of knots. First wash the bowl and the spoon in warm water. Pour into the bowl as much boiling water as is required for the poultice, then gradually add the flour, stirring briskly all the while. There should be no knots, and it should be neither too dry nor too moist, but such as will turn out off the bowl without sticking to the sides. Spread it on warmed calico or linen to about one inch in thickness, lifting it with a fresh spoon, which should be first put into water, or the substance will stick to it. Cover it over with a layer of very thin cloth or muslin, and apply to the surface. The heat should be such as can be borne on the back of the hand, and not more. Having applied the poultice, cover it with cotton wool or lint to keep in the heat, and over all put a mackintosh or oiled silk, then secure it to the spot by a bandage or napkin. Remove the poultice as soon as it begins to get cold, say in one hour, or two, at the most, and apply a fresh one. Have the new application quite ready before the old one is removed. When it is desired to remove the poultice altogether, it is well to wash the part freely with warm water and soap, and apply a thick layer of cotton wool and a bandage.

Should there be much discharge from the wound that is being poulticed, such as is found in an abscess, then absorbent cotton

should be applied in such a way that it will cover the poultice and absorb the discharge.

In making an oatmeal poultice some suggest that the meal should first be boiled, as it is rather hard. The poultice should be moist and soft.

In making a bread poultice, boil some coarse stale bread crumbs in water for eight minutes. Drain off the water to get rid of the alum contained in most breads, and spread the whole on a piece of linen. This makes an excellent poultice, as it is soft and well suited for small affections. Brown-bread is good for the purpose as it "draws better." A mixture of this bread poultice and linseed meal makes an excellent poultice. Before applying, add a few drops of warm oil to the surface, and it will prevent the poultice from sticking, and will be a lubricant to the irritated skin.

In order to give to any of the above poultices antiseptic properties, it is only necessary to add some powdered charcoal, or boracic acid, or iodoform, and stir the mixture well throughout the whole mass; this will keep down all fermentation and smell. It is well also, before applying the poultice, to sprinkle the surface with any of the substances chosen.

A warm-water dressing is allied to a poultice. It is a most soothing and comfortable application, and is the simplest form in which moisture and warmth can be applied to the body. In order that it may be effectual, it must be so put on the skin that it will retain its heat and moisture as long as possible. Take a piece of lint folded two or three ply, as large as the part it is desired to affect; put the same into hot water, wring it, and apply to the skin. Cover the lint with a piece of oiled silk or gutta-percha tissue, larger than the lint, all round, by about one inch. This prevents the lint from cooling and drying. Secure the lint by a bandage. The dressing should be renewed every four hours or so. If the skin is whole, all that is required is to reapply the lint after being dipped afresh in hot water; but if it is applied to an ulcer a fresh piece of lint should be applied every time.

Baths and packs, and how to administer them.—Bathing is the application of water in some form or other to the body. It may be indulged in for the purposes of cleansing or cooling the frame, but it may also develop into a branch of therapeutics, and become a means of removing stiffness, pains, and fatigue.

In a country like Africa every person should take a tepid bath at least once a day. Only the robust should bathe in the lakes, and that only when the sun has risen somewhat—say about eight in the morning; and nobody should ever attempt to bathe in mountain

streams. On entering the water, first wet the head and the chest, and go on to the abdomen and limbs. No bath should be taken immediately after a full meal, but may be indulged in after a very slight repast in the morning. A kettle of hot water should always be poured into the cold bath before entering. As long as the bather feels a warm glow on emerging from the water, all is well, but if this is not so, and on leaving the water he trembles, and his limbs have a blue duskiness, then he has over indulged, and in future must reduce the length of the time of the bath.

Hot, warm, and tepid baths.—In preparing these always test the temperature by the thermometer, as the sensation to the hand is deceptive. A hot bath varies from 97° F. to 105° F., and may be indulged in for ten minutes. A warm bath is from 91° F. to 97° F., and may be indulged in for say a quarter of an hour. A tepid bath is from 84° F. to 91° F., and may be indulged in rather longer than any of the others. If any of these baths are given to a patient they should be administered before a fire, and on emerging from the water a warm blanket should envelop the bather. As a rule the body should be under the water up to the neck. In giving a hot bath always remember that the heat is apt to bring on a state of faintness, especially in the weakly and feverish. The patient is apt, in such a case, if not looked after, to be drowned. It should be a rule, therefore, never to allow a person in fever to be alone in taking such a bath; and the moment faintness is complained of, the bather should be taken out of the water. Sponges are not good, as they harbour all sorts of impurities in the interstices: rather use a wet towel or the glove. On emerging from the water rapidly rub the whole body with a wet towel wrung out of the water, then briskly dry the frame. The idea is to quicken the circulation and set up a warm glow throughout the body. Hot baths stimulate and excite the nervous system, and should be used when the system is depressed; tepid baths calm and soothe the frame, and should be indulged in after great worry and nervous strain.

Graduated cold baths are most useful means of reducing the temperature in hyperpyrexia. If the temperature is 105° F., with coma and a burning skin, this form of bath is an excellent means of reducing the severe fever. The bath to be used should be a large one in which the patient can lie at full length. In giving the bath let many buckets of cold water be at hand, and let the temperature of the bath be about the same temperature as that of the sufferer. Remove all wearing apparel and other clothing, and throw a large soft towel over the patient. Let a strong blanket be slipped below,

and let him be lifted from the bed and lowered into the bath. Gradually add cold water along the side so as not to touch the body of the sufferer, till the temperature reaches about 70° F. While the patient is in the water keep a thermometer in his mouth or rectum, and as soon as the body heat is normal let him be lifted out, and thoroughly rubbed and dried. The bath may be continued for half-an-hour, and may be repeated several times. If the slightest sign of shivering appears, or if the patient becomes blue, let the bath be stopped at once. Put the sufferer to bed between hot blankets. Let hot-water bottles be applied to the feet and abdomen, and warm beef-tea, or even brandy, be given by the mouth or rectum. Such a cold bath must be given with the greatest of care, as, while it is most efficacious, it is not without danger.

A cold foot-bath.—In this form only three or four inches of water should be in the bath, and the soles of the feet only should be immersed. Don't keep the feet in more than from three to five minutes, and all the while let the feet and limbs be briskly rubbed. On removal, dry the feet well with a coarse towel, and continue the friction. These baths are good where the feet are constantly cold. If a little coarse mustard be added the bath is made all the more effective.

A hot foot-bath.—Here the water in the basin is to be as hot as can be borne, and is of such amount as will immerse the feet. The patient should sit with the feet in the water, and the body and knees covered with a blanket. Keep the feet immersed for about half-an-hour. From time to time add warm water, so as to keep up the temperature. Mustard added makes the bath all the more effective. At times it is desirable to give this bath when the patient is in bed. This can be done by the subject lying with the feet in the bath or with the limbs hanging over the end of the bed. It is very effective in stopping a cold, if the bath is taken at the very outset of the shivering.

Hip-baths are used where it is desirable to stimulate the hips and the organs in the abdomen and pelvis, without bathing the whole body, as for instance in piles. Let the bather be covered with a warm blanket, and sit in the bath for a quarter of an hour, with the water as hot as can be borne. See that the legs and feet are not exposed, and that too much water is not put in the bath, as on sitting down the water may run over.

The arms and legs may also be bathed separately from the body. Zinc baths are made the shape of the limbs, with loose covers to keep the water warm and protect the blankets of the

bed. In the treatment of certain skin diseases, these baths are very useful.

Hot-air baths are used to promote profuse perspiration. The patient is put to bed wearing only flannel sleeping garments, and lying on a blanket instead of a sheet. Over the limbs is placed any form of cradle which will keep the upper blankets from directly enveloping the body by about a foot or so. Over this is placed a blanket or two, and the patient is carefully tucked in at the neck and sides. A lamp is then lit, and by means of an indiarubber tube the hot air is led under the cradle and the blankets. By this means the hot air envelops every part of the body and induces a most copious perspiration. The chest must be covered by a towel wrung out of cold water, another wet towel rolled like a turban should envelop the head, while a mackintosh should be put over the pillow. The patient must not be left alone, and should not be kept in the hot air longer than twenty minutes.

Vapour-baths are prepared exactly as the above, and are most useful when it is desired to induce free perspiration in malarial fever. They are most applicable for Africa. The patient is put to bed in the usual way between blankets. A cradle is put on the bed with blankets thrown over; only instead of using a hot lamp use a kettle and lead the steam, by means of an indiarubber tube under the blankets; or let the patient sit on a cane-bottomed chair and envelop the whole body down to the ground in blankets, and put the kettle, heated by a spirit-lamp, under the chair. A quarter of an hour will suffice to bring about a free perspiration. If the patient drinks cold or hot fluids in profusion, or if he takes pilocarpine hypodermically, the perspiration will be all the more profuse. The temperature under the blankets should not be more than 110° F. The head should always be kept cool by cold cloths.

If the above tubing is not at hand, envelop ordinary hot-water bottles in damp cloths, and put them on a plate under the cradle; or heat bricks, and envelop them in damp cloths, and put them on plates under the blankets. The vapour bath given by means of a tube led from a kettle is an excellent arrangement in treating black-water fever.

Mercurial vapour-baths.—This is an excellent means of giving calomel in cases of syphilis. The patient sits on a cane-bottomed chair enveloped in a long blanket, which reaches to the ground and embraces the chair all round. Then under the chair place a spirit-lamp, and in a watch glass or other vessel place 10 grains of calomel, and let the drug be consumed over the spirit-lamp. According as it is desired to give a vapour bath or a hot-air bath insert a

tube from a kettle. The calomel will be vaporised and enter the system by the open pores. In half-an-hour the calomel will have disappeared. Let the patient thereafter take great care against cold.

The cold, wet pack.—This is an excellent means, in severe fever, of reducing the temperature, removing delirium, moistening the burning skin, bringing about a profuse perspiration, and inducing sleep. Prepare the bed by placing a large mackintosh over the whole mattress and a blanket over that. Under the blanket place two strong binders a foot in breadth across the bed, one at the calves and the other at the shoulders, where the patient will lie. Then let the patient, stripped of all clothing, lie under a blanket, occupying the far-off side of the bed. Dip a sheet in cold water and wring it out as completely as possible. Fold it lengthwise, and lay the edges towards the patient. Then, as one edge is lifted up, let the patient roll himself naked on to the sheet. Quickly envelop him in the wet sheet and blankets. Put the hands under the patient's feet, and wrap them in the sheet, and tie them down by the binder. Tuck everything well in round the neck, and tie the binder that is under the shoulders. Put on four or five blankets, and it may be a mackintosh, and see that the neck and body is well tucked in. Let the patient lie for half-an-hour—not more—and a free perspiration will be induced. In that time remove the sheet, and, by means of tepid water, sponge the whole body, rubbing freely and drying thoroughly. Put on warm clothing, and let the patient rest quietly. In all probability the temperature will be greatly reduced, and sleep brought about. If the pack is agreeable to the patient, and the severe fever returns, this procedure may be adopted every three or four hours. Copious draughts of cold or hot water further induce the perspiration.

The hot, wet pack is given exactly as the above, only, instead of cold water, hot is used at a temperature of 112° F. When the patient is enveloped, three hot-water bottles are placed to the feet and body. In giving these packs the patient must be carefully watched, and if faintness is induced they must be discontinued. Yet given with care they are a means of controlling exhaustion and fever. After half-an-hour in the hot sheet the body should be well sponged, freely rubbed, and rolled in hot blankets.

The half-pack.—This pack is more easily given than the above, and is specially applicable to children. Two towels are wrung out of cold water under the blankets, one is placed below the body from the shoulders to the hips, and another above the body from the armpits to the thighs. The limbs are not covered by the wet sheets. Blankets are then well tucked in round the patient,

and quietness is induced for half-an-hour. It may also be a good plan, in less severe cases, to lay only one towel over the chest and abdomen, under several blankets. In removing the wet sheets the body should be sponged and rubbed in the usual way.

Cold and tepid sponging is most soothing to the fever-stricken patient, where there is great restlessness together with a hot burning skin. Let some hot water, about 116° F., be poured into a basin to which some toilet or aromatic vinegar is added. Then take a piece of mackintosh the size of a large towel, cover it with a warm towel, and lay it under the limb to be sponged. Expose an arm, washing it thoroughly with the tepid water and drying briskly. Do the same to the various limbs and the body, taking care not to expose a great part of the skin at once. Then cover the patient, putting a hot-water bottle to the feet and a cold cloth to the head. The result will be a great reduction of the temperature and a calming of the nervous system, which may lead to sleep.

The above may be varied by sponging the limbs with strong vinegar or acetic acid, and washing the acid off with hot water, drying and rubbing thoroughly.

Cold and tepid douche.—This means the applying of cold or hot water, in a continuous stream, to any part of the body, in order to reduce inflammation or relieve pain. It is most applicable where a joint is affected, or where it is necessary to wash out a cavity of the body, as the nose or rectum. The water, cold or hot, is put into a basin at some distance above the level of the patient, and an india-rubber tube is placed in it. By sucking the tube, or drawing the fingers along to exhaust it of air, the stream of water will flow, and can be directed to the desired spot. Common sense will direct the patient in washing out the rectum, &c., by covering the bed with mackintoshes and receiving-pans. It is an excellent mode of washing out the rectum, in the treatment of dysentery.

Medicated suppositories are most useful means of introducing various medicines into the rectum. They are made from some fatty material which is of considerable consistency at the temperature of the atmosphere—as cacao butter—but soluble within the bowel. Intimately mixed with the fatty material is the drug to be administered. They are always shaped like cones, and can easily be introduced within the anus by the patient.

How to change the sheets, and bed-side hints.—Every morning the face and hands of the patient should be washed with soap and warm water, and as often as need be the hands should be washed through the day. If the illness is prolonged, a warm bath

should be given once a week ; or if this is not convenient, the whole body should be sponged once a week, taking one part at a time. The teeth should be washed every morning with camphorated chalk or common salt. If the patient is too weak to do this alone, the person who nurses should wash the mouth and teeth with a little flannel, tied on a stick, dipped in Condyl's fluid. Attend to the skin on the back and hips, or wherever the bones protrude. Every day, after washing, dust all red spots on the back with starch and oxide of zinc, in equal quantities. Boracic acid is also excellent for this purpose. Remove all wrinkles in the sheets, and crumbs of bread should on no account be allowed to gather about the bed. If the skin becomes very red over any of the bones, most carefully, by means of a piece of flannel, rub in a little spirit of wine or whisky or other spirits ; this is admirable for hardening the skin, and preventing it from breaking and forming a bed-sore.

In some cases it is necessary to change the sheets without disturbing the occupant of the bed. Do this by folding up the soiled sheet while the patient lies to one side of the bed. While the soiled sheet is being rolled the clean sheet, rolled in the same way, can be spread on the bed. The patient can then gently turn from one side to the other over the two sheets. The soiled one is then removed and the clean sheet spread out. Or the sheet can be removed from the top of the bed to the bottom. The fresh sheet is first rolled up in its length ; then the patient's head is raised, and the soiled sheet taken from the pillows and the clean one adjusted. The patient is then gently raised, and the sheet rolled out until it is spread under the limbs and the soiled one removed.

How to lift and move the patient.—It is necessary at times, although the patient cannot actually leave the bed, that he be lifted, as in changing the bed and in using the bed-pan. This may be done, if the strength is sufficient, by one person passing one arm under the knees and the other below the shoulders, while a second adjusts the bed. In other cases it may be done by the patient moving or rolling from side to side.

If the patient is very helpless, it will require three persons to lift with due care. Two persons stand on either side of the patient and under him join hands. One pair of hands is placed on the back, about the region of the shoulders ; or the arms of those lifting may cross one another, the hands being placed on the opposite shoulders. The other pair of hands are laid below the hams of the patient. As he is lifted the third person attends to the broken limb, &c.

No bed-pan or urinals should, after use, be allowed to remain in the room or hidden under the bed, but should be covered, placed

in an *Ntanga* or large native basket, carried out of the room, and the contents buried. After being emptied, get the native attendant to wash thoroughly with hot water, to rinse out with carbolic acid (1-20), wash again, and take into the room. *This is important.*

How to remove the disabled.—The assistance required will vary with the nature of the case, and very often calls for an exercise of tact and ingenuity.

Where a person is weak from loss of blood or from an injury, but is still able to walk, stand at the disabled person's side, pass your arm behind his back, putting your hand on his distant hip. Ask him to put his arm round your neck and over your shoulder. Then with your free hand grasp firmly the hand laid on your shoulder, and keeping step together, move slowly along.

Where a person is unable to walk through the limb being broken or other accident.—If the patient is a child or very light in weight, the best way is to carry him in your arms. Place your right arm under the thighs, and the left round the body under the shoulders. Ask the patient to grasp you round the neck and to endeavour to raise the body. When two persons are about to help a patient who is disabled, let them form a kind of "hand chair:" let the two bearers stand face to face, and join the front pair of hands, allowing the fingers of the right hand of the one person to interlace with the fingers of the left hand of the other; let the hands so interlaced form a seat; then let the other arms cross each other so that each has a hand on the shoulder of his fellow; this will form the back of the seat. The disabled person now sits on this seat, and may put his arms round the necks of the bearers.

Another very good plan, applicable for carrying wounded persons, or for crossing rivers on the arms of natives, is to use what is known as the "four-handed seat." It is very comfortable for the person who is being borne, and is less of a strain to those who are bearing. Let the bearers stand facing each other; let each man grasp with his right hand his own left wrist; then each grasping the right wrist of his fellow, a four-handed seat will be formed. (See Fig. 42.)

Water and a few hints regarding it.—In a new country such as Africa, it is absolutely essential, if we wish to enjoy even a measure of health, and be saved a world of trouble, to pay most careful attention to the water supply. Water, both in its liquid and solid state, contains a variable number of micro-organisms, which have been named *water bacteria*, and which do not grow at the higher degrees of temperature. Some of these low forms of life, in their growth on water, set up an ammoniacal fermentation,

which accounts for the stench of some stagnant pools. The cholera bacillus was discovered by Koch in the drinking water of Calcutta. The bacillus of typhoid fever also grows in the water of stagnant pools. Many of these water bacteria in their growth form pigment of *red*, or *green*, or *bluish* tint which covers the stagnant pool as by a coloured scum. Others, again, exhibit a phosphorescence which is brilliant. These bacteria of water find an ideally suitable nidus only when the water has been stagnant for some time. In fresh spring water the life is said to sink to the bottom of the spring and attach itself to the decaying leaves and

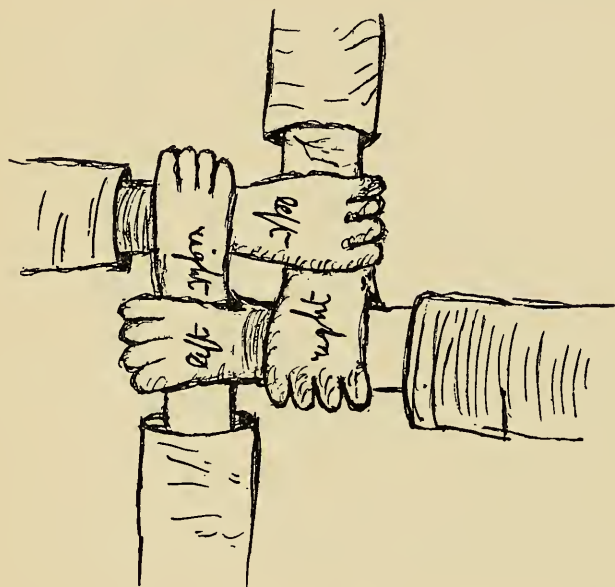


FIG. 42.—FOUR-HANDED SEAT. (Right over left.)

roots found there. The life is seldom carried to the spring by water which percolates through strata, but comes from the damp surface of the ground or from the superficial layers of soil.

Water bacteria are removed from water by good filtration. Perhaps the Kaolin filter made on the Chamberland-Pasteur principle is the best.

It is impossible in Africa to carry a huge filter with one at all times, and as pure water is so essential to health it is wise, while travelling, to know how to secure even moderately good water. The following hints are so excellent that I venture to quote them

in full. They are taken from "The Surgeon's Pocket-Book," by Surgeon-Major Porter.

"When the halting-ground is reached it may be necessary to filter the water. A common plan is to carry a cask, charred inside, and pierced with small holes at the bottom; it is sunk in a small stream, and the water rises through the holes. A better plan still is to have two casks, one inside the other; the outer pierced with holes at the bottom, and the inner near the top; the space between is filled with sand, gravel, or charcoal if procurable; the water rises through the gravel between the barrels and flows into the inner barrel. (See Fig. 43.)

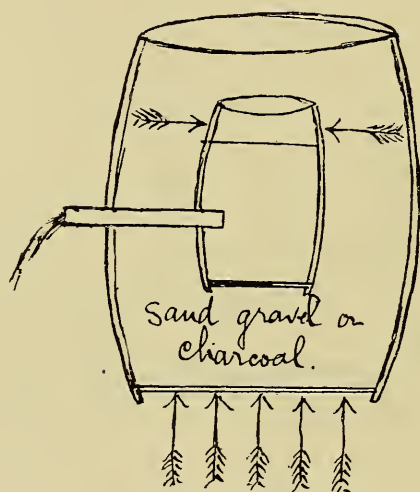


FIG. 43.

"It is advisable to heat sand or gravel to redness before using; the same applies to charcoal, if there be any question of its purity. All these media must be changed frequently.

"Arrangements (must be made) for the different places of supply. Men and cattle should be watered at different points; places should be assigned for washing; and if removal of excreta by water be attempted, the excreta should flow in far below any possible spring. In case of a spring, several reservoirs of wood should be made, and water allowed to flow from one to another—the highest for men, the second for cattle. If it is a running stream, localities should be fixed for the special purpose; that for the men's drinking water should be highest up the stream, for animals below, washing lowest."

Where drinking water is taken direct from the river, which is generally very muddy, a lump of alum is moved rapidly through it with satisfactory results, in proportion of 6 grains to a gallon.

"In the Ashanti campaign of 1873 the water was purified by Surgeon-Major Gouldsbury's direction in the following way, in the absence of proper filters : alum was added to precipitate suspended matter ; the water was passed through a rough filter consisting of (1) sponge, (2) sand, (3) charcoal in pieces ; it was then boiled, and a few drops of solution of potassium permanganate added. Water even taken from a hole in a marsh was innocuous after this treatment.

"As it is unlikely that any organic poison will resist the temperature of boiling, it is of the greatest importance that all suspicious water should be boiled before use. During epidemics this is essential. It may even be advisable to try and supply the men with distilled water at such times ; any sort of rough still would answer. One great advantage would be that impure water could not be substituted for it, as a few drops of solution of nitrate of silver would at once detect the presence of chlorides, which are present in all except distilled water.

"The Russian soldiers abstain from drinking water on the line of march in their Turkestan routes until the end of the day's journey, when they at once make tea and then assuage their thirst.

"In judging of water a few rough qualitative tests may be useful. 1st. Try, as far as possible, to get water that is clear, free from sediment, and colourless. 2nd. Test it with a little nitrate of silver solution and a few drops of dilute nitric acid ; good water should give only a faint haze. 3rd. Add a few drops of Nessler's solution ; good water should give no colour ; a yellow tinge makes the water suspicious. 4th. Add a little permanganate of potash solution ; good water should remain pink for about ten or fifteen minutes ; if the colour fades rapidly, or becomes brown, the water is to be suspected. 5th. Add some solution of starch, a little iodide of potassium solution, and a few drops of dilute sulphuric acid ; if a blue colour appears at once, or within a minute or two, the water is suspicious. Other tests may be added ; but these are generally sufficient for practical purposes, while they entail the use of no special apparatus."

Latrines, and the attention they demand.—In making a latrine for natives, it is essential that the trench should be made as narrow as possible, say two feet, and about four feet deep. It should be so situated that it is impossible for any infiltration in the soil to reach the drinking water. An enclosure of reeds should be

run up so as to hide the place from view ; or, if possible, the trench should be dug in a wooded enclosure, and a goodly distance from the dwelling-house. Daily at least the bottom of the trench should be covered to the depth of three or four inches with mould or good earth. Sand, being porous, is not so good for this purpose. The ashes from the kitchen fires, especially the wood ashes, may with great advantage be daily spread in the neighbourhood of the latrine. Carbolic acid and permanganate of potash should, at stated periods, be freely sprinkled about.

It is impossible to denounce in too strong language the native practice of "going to the bush." Where influence can be brought to bear on them, it should be directed to this particular. Suitable retreats should be built for the men themselves, and the strictest orders issued.

For Europeans in the tropics the "earth-closet" is excellent. It should be attended to by the native servants once every day, and carbolic acid freely used.

CHAPTER XVI

SICK DIET AND COOKING FOR INVALIDS

THE quantity and quality, as well as the frequency, with which food should be given are in every case to be determined by the person who is nursing the sick.

Serving of food.—If fluid only can be taken, it should be given frequently and in small quantity. Give a stated amount every two hours, but in certain cases it may be given every hour or every half-hour. If the patient can take solid food, it should be given not oftener than every four hours. Whatever the interval may be, it should be given with great punctuality. Let the food for the sick always be served in small quantity, and with scrupulous attention to cleanliness and taste. Encourage the seeking for a second supply, rather than the discarding of a quantity of food. Whenever the meal is over, take everything away at once; a sick person comes to loathe the very idea of food when the remains of the former meal are perpetually before the eyes. Moreover, it is very bad for a sick person to be constantly nibbling at food, however tempting, as the stomach is weak, and needs rest as well as other organs.

Milk diet.—It is a good plan to set aside night and morning a vessel which contains a certain known quantity of milk, and this should be kept for the sole use of the invalid. So many low forms of life grow on milk, it is wise, knowing that the resisting power of the mucous membrane of the stomach is weakened, in every case to boil the milk before it is used. Boiling for a few minutes destroys every form of germ that may have lodged on the milk. Milk is the food to be relied on in fever. Milk and albumen of egg are perfect foods, in that everything necessary for life are present in perfect proportion.

Water, if possible, should always be filtered in a Kaolin filter on the Chamberland-Pasteur system. If not, it should be boiled, and cooled, and exposed to the air to be aerated. It should be kept as cold as possible. Ice should be sucked if this is to be had.

Oatmeal gruel.—Take two tablespoonfuls of fine ground oatmeal, and mix well with two tablespoonfuls of water. Then put a tumbler of cold water in an enamelled pan, and add the oatmeal while the water is on the fire. Keep constantly stirring, and let it boil for at least half-an-hour. Add salt or sugar according to taste. If the gruel is prescribed for a cold, add a piece of butter as large as a walnut, and two tablespoonfuls of spirits, if it is desired to stimulate.

Boiled bread and milk.—Wash out a large-sized bowl most thoroughly with boiling water; then take stale or dry bread, and break it into small pieces, each about the size of a marble, and put them into the bowl. Boil a tumbler of fresh milk, and as soon as it rises in boiling, pour it over the bread; with a plate cover the bowl for a quarter of an hour, and serve.

Toast water.—Thoroughly brown a slice of dry bread before a fire; break it into a bowl, pouring two tumblers of boiling water over the bread till all is covered. Set it aside for an hour. Strain, and salt according to taste.

Barley water.—Take four tablespoonfuls of good barley and wash it several times in cold water. Throw these various waters away. Put the barley into a jug; add the rind of half a lemon cut into three or four pieces, and two teaspoonfuls of good sugar. Then pour two tumblers of boiling water over the whole, and set it beside the fire to simmer. In an hour add the juice of the half lemon, and set aside to cool. When cool, strain and serve.

Rice water.—Take two tablespoonfuls of rice, wash it well; then take six large raisins and cut them into fine pieces, allowing the stones to remain. Put the rice and raisins into a pan, with three tumblers of water, and allow the whole to boil for fully an hour. As the boiling continues, it may be necessary to skim occasionally. Strain through muslin, and allow the whole to cool. If the patient requires to be stimulated, it may be necessary to add a teaspoonful of brandy or rum.

Whey with wine.—Take one tumbler of fresh milk and heat it in a goblet; before it boils pour in one wineglassful of sherry or port wine; stir vigorously while it is curdling. Then through a fine linen cloth strain the whole. Add a little sugar, and it is ready for use.

Lemonade.—Take three yellow lemons and skin them. Put four tablespoonfuls of sugar into a large bowl, together with the yellow rind of the lemons. Then squeeze the four lemons in a linen cloth, allowing the juice to go into the bowl, but keeping back the fibres and the pips; pour on the juice one tumbler of boiling water; cover the same with a plate, and let it stand for six hours or until

it is quite cold. Strain through a linen cloth, and bottle. Do not keep longer than two days. Two tablespoonfuls of this mixture in a tumbler of water, and it may be with a little soda, makes a refreshing drink.

Banana wine.—Take twelve large ripe bananas (the plantain named *Inghewho* is considered best) and macerate them well in a basin; add twelve breakfast-cupfuls of cold filtered water, cover and allow to stand for twenty-four hours. Strain and bottle the liquid for other twenty-four hours, when it will be ready for use. This is a most refreshing drink.

Poached egg.—Into a small enamelled pan or other shallow cooking vessel, put one tumbler of water, half teaspoonful of salt, and half teaspoonful of vinegar. Put the pan on the fire to boil. Meantime break an egg into a cup, and as soon as the water in the pan boils vigorously, drop the egg into the water, and cook for one and a half minutes. Have a slice of warm buttered toast ready, and put the poached egg on the same, and set before the patient while hot.

Egg-flip.—Put the yolks of two eggs into a cup, together with one tablespoonful (or less) of fine sugar, and if desired to stimulate, add two teaspoonfuls of brandy, and flip the whole together. Or, if desired, this might be dropped into a tumbler and filled up with gasogene water or milk.

Egg-milk.—Take the white of two eggs and whip them in a cup till they are beaten into a stiff froth; then stir into the cup half a tumbler of fresh milk. This is very good for those who are recovering from a severe illness.

Beef-tea.—Take about 1 lb. fresh lean beef, with all fat removed, and cut it up into small pieces; sprinkle a saltspoonful of salt and a little pepper over the same, and put it into a cooking pot with a tumbler of cold water. It is very important that the water should be cold. Put it on the fire, and as soon as it boils set the pot to the side and let it simmer for six hours or more with the lid on. Do not let the “tea” boil again after the first boiling, but merely “infuse,” so to speak, at the side of the fire. After six hours pour off the tea, skimming all fat, and let it be served hot or cold as desired.

Beef-tea quickly made.—Prepare the same quantity of beef as the above, let it boil for seven minutes only, and serve. It is not so nutritious, but is good in an emergency.

Chicken-tea.—Take one young chicken, remove its skin, and cut the meat off the bones. Mince the meat into small pieces, removing all fat. Allow it to stand for half-an-hour, in as much

cold water as will cover it. Then put in two tumblers of cold water, salt, pepper, &c., and let it boil for ten minutes. Stop the boiling, but let it simmer beside the fire for three hours. Now add the yolks of two eggs, and carefully remove every particle of fat. Stir over the fire, but do not let it boil, or it will spoil. Strain and serve.

Essence of beef—bouillon.—Take 1 lb. of lean beef finely minced, and to it add two tumblers of water. Stir thoroughly, and allow it to stand under cover for six hours in a cool place. Strain the red-looking water through linen, pressing out, with the washed hands, the last portion of meat juice. Then put on the fire a goblet half full of water ; when boiling, place the above juice in a jar, and put the jar in the boiling water and boil for one hour. Then strain, or filter if possible, and the result will be a clean straw-coloured fluid. Season this to taste. *This is excellent for weak persons.* If it is desired to feed by the bowel, take four tablespoonfuls of this essence, add a little salt, and half a teaspoonful of peptone. Dissolve the whole, and by means of a syringe inject slowly into the bowel. (See page 176.)

An omelet.—Beat up three eggs in a cup, adding a little pepper and salt. Take a piece of butter the size of one of the eggs, put the butter into a pan over the fire and melt it, then pour in the flipped eggs, and constantly keep the pan revolving. Do so till the whole looks like cream. Then stop revolving, and let it remain on the fire for about one minute. Slip a knife under one half of the omelet and turn it over on the top of the other half, so as to make it oval in shape. When the under side is golden in colour it is ready. Have a hot plate at hand, and over this reverse the omelet quickly, with the brownish golden side uppermost. The omelet should be creamy inside, but golden brown outside, when it is served to the patient.

Chicken soup for an invalid.—Prepare a young chicken by skinning it and cutting the limbs and body into small pieces, and put it into a bowl with as much water as will cover it fully. In the course of a quarter of an hour throw away the water, in which the fat will be floating. Wash again, and put into the cooking goblet, with four tumblers of cold water, salt, &c. Put the whole on the fire, and allow it to boil for five minutes. Then set by the side of the fire and allow it to simmer for four hours. By this time the meat will have been separated from the bones, and the gelatinous substances of the tissues dissolved into the fluid parts of the soup. Take the solid parts of the muscles that remain and pound them in a mortar, adding the whites of three eggs and a tumbler of good milk.

Then add the whole again to the soup in the goblet. Stir the soup on the fire, but be careful that it does not boil, or the boiling will cause the milk to coagulate. Strain and serve. It may be set before the patient with or without little squares of toast.

Potato soup.—Take fully 1 lb. of native or European potatoes and cut them into slices, along with a good-sized onion, or half-a-dozen shelots, and one teaspoonful of butter. Put all into a stew-pan and add two tumblers of water, and let the whole boil till the potatoes are reduced to pulp. Then into a second pan put one tumbler of fresh milk and heat it, taking care that it does not boil. Then take the contents of the first stew-pan and pass them through an ordinary kitchen strainer, adding the heated milk in the second pan. Put beside the fire for a short time, add salt and pepper, and allow the soup to come slowly to the boil. When it boils the soup is ready.

Mutton soup.—Take 1 lb. of good mutton free from fat, chop it very fine, and put it into a goblet with two tumblers of water; cover, and allow to come slowly to the boil. Then, if necessary, it can be carefully skimmed, so that all froth, fat, &c., are removed. Let it go on simmering for two and a half hours. Then take one tablespoonful of rice, or the same quantity of fine barley, and let it be washed in several waters. Add this rice to the soup, together with an additional half-tumbler of water. Let this simmer beside the fire for another hour. This can now be strained and served hot, or it can be strained and set aside till cold, or can be kept till next day. It should, however, be served hot if possible, and always with little squares of brown toast.

A chop.—If possible let the chop be taken from the loin. Prepare a saucepan, or other flat dish, by having it well buttered over a hot fire. Turn the pan from side to side so that it does not burn, and yet is well heated all over. Let the chop be well salted and peppered, with a piece of butter the size of a walnut on its upper surface, and let it be laid on the hot saucepan. Put the pan, if possible, in a hot oven, and let it cook for five minutes. If not, cover it by means of a plate, and let it lie over a hot fire. Take it off and turn the chop, and again give it five minutes. Then place the chop on a hot plate: pour into the sauce that is now in the saucepan two tablespoonfuls of the cream of milk, if it is to be had, and make a sauce by stirring briskly and allowing it to boil over the fire. Pour this sauce over the chop, and serve in a tempting way to the patient.

A grilled chop.—As in the above, let the chop, if possible, be taken from the loin. See that the fire is a white heat and that no

smoke is about. Then put the gridiron on the fire till every wire is hot. Take it off and rub both sides with fat, so that the chop may not stick. Place the chop upon the gridiron and cook for ten minutes, all the while turning the chop round from side to side. Do not keep one side down longer than say eight seconds. By this means you secure that the chop is well browned, with all the fluid substance inside. The hot fire coagulates the superficial albumen, and keeps the juice within.

A palatable custard.—Take four eggs and the white of an additional egg, and beat them very briskly in a bowl, adding one teaspoonful of sugar and one tumbler of fresh milk. Then take an ordinary pie or custard dish, and butter it well inside; pour the whipped-up contents into the same, and place it in an oven fairly well heated. There let it remain for a quarter of an hour, without being moved, when it will be ready for serving. If it is moved while inside the oven, the custard will be curdled and not set.

Tea.—Sir Andrew Clark tells us that the best tea is made with boiling milk instead of boiling water, and that it should be allowed to stand for four minutes exactly.

There are two or three secrets in the art of making tea, which are so insignificant that they are apt to be put down as fads. They go, however, to the infusing of an “excellent cup of tea.” *First*, the water should be fresh; *second*, the tea should be infused the moment the water boils; *third*, the teapot should be very hot before the tea and boiling water are added; and *fourth*, the teapot should be dry. Then, allowing two cups of tea for each person, put into the teapot one teaspoonful of tea for every drinker, and one teaspoonful for the teapot. Pour the boiling water on the tea, and let the tea stand for four minutes under a tea-cosy. Do not allow it to stand longer, but pour off the tea into a second teapot or jug. If the tea-leaves remain longer in the infusion, they tend to make the tea bitter.

Coffee.—Coffee in its preparation should never be boiled, and should always be served very hot. Let the coffee-pot or jug be heated by boiling water and dried. Then for every cup add one tablespoonful of coffee, and pour in one cupful of boiling water. Cover and let it “mask” beside the fire for five minutes. It should never boil. Some recommend that, in order to stir the contents gently, it is well to pour off a little of the coffee into a cup and pour it back again. Do this three times, and at the end of ten minutes, serve. Add two-thirds of a cup of such prepared coffee to one-third of a cup of boiled milk. It is important that the milk should be boiled.

APPENDIX NO. I.

WEIGHT IN HEALTH.

Average Weight of a Healthy Man.			Average Weight of a Healthy Woman.			Average Weight of Healthy Children.		
Height.		Weight.	Height.		Weight.	Boys (weight).		Girls (weight).
Ft.	Ins.	St. Lbs.	Ft.	Ins.	St. Lbs.	Age.	St. Lbs.	St. Lbs.
5	2	9	4	10	7	5	3	2
5	3	9	4	11	7	6	3	12
5	4	9	5	0	7	7	3	1
5	5	10	5	1	7	8	4	3
5	6	10	5	2	7	9	4	6
5	7	10	5	3	8	10	4	10
5	8	11	5	4	8	11	4	1
5	9	11	5	5	9	12	5	4
5	10	12	5	6	9	13	5	13
5	11	12	5	7	10	14	6	8
6	0	12	5	8	11	15	7	0
							8	7
							5	8

The above table giving the average weight of healthy men is compiled from Dr. Hutchinson's table.

The above table giving the average weight of healthy boys is taken from the British Association's Anthropological Committee's Report.

The above table giving the average weight of healthy girls is taken from the State Board of Health Report, Mass., Boston, U.S.A.

It is most important to take a monthly weight during residence in Africa. Such, if kept with care and regularity, would be valuable.

APPENDIX NO. II.

MEDICINES

As far as possible, they should be supplied in tabloid form, as thus they are accurately administered without the use of scales, are easily swallowed, and breaking up readily in the stomach, are speedily absorbed into the system. Weight in carriage is also minimised. Those supplied by Burroughs, Wellcome & Co., Snow Hill Buildings, London, E.C., are excellent, as this firm pays special attention to foreign export. Their hypodermic medicines are all that could be desired.

The following list embraces **medicines that are necessary for the treatment of malarial fever** in its various forms. No one should go to Africa without these. They can be supplied in a portable medicine-chest, and the majority are in bottles containing 100 tabloids.

Bisulphate of quinine, 2-grain and 5-grain tabloids.

Tannate of quinine, 2 grains. Excellent for children when given in milk.

Hydrochlorate of quinine (muriate of quinine) : dose, 1 to 10 grains.

Quinine, iron, arsenic, and strychnine pills : dose, 1 before food three times a day.

Arsenious acid—white arsenic : dose, $\frac{1}{50}$ grain.

Liquor arsenicalis (Fowler's solution) : dose, 2 to 8 drops in water after food.

Liquor strychnine : dose, 5 to 10 drops.

Phenacetin : dose, 10 to 15 grains.

Antipyrin : dose, 10 to 15 grains.

Calomel : dose, $\frac{1}{2}$ to 5 grains.

Jalap—*pulvis jalapæ compositus* : dose, 20 to 60 grains.

Dover's powder—*ipecacuanha* and opium : dose, 10 grains.

Ipecacuanha powder, as an expectorant, $\frac{1}{2}$ to 2 grains ; as an emetic, 15 to 30 grains.

Laudanum—tincture of opium : dose, 10 to 30 drops.

Dilute sulphuric acid : dose, 5 to 30 drops.

Tincture of the perchloride of iron : dose, 10 to 30 drops.

Easton's syrup : dose, 1 teaspoonful.

Warburg's tincture : dose, 6 to 8 tabloids.

Tincture of aconite : dose, 1 drop every hour.

Sulphonal : dose, 15 to 40 grains, given an hour before sleep is desired, and followed by a drink of hot fluid.

Sulphate of zinc, as an emetic, 10 to 30 grains.

Salicylate of soda : dose, 10 to 30 grains.

Croton oil : dose, $\frac{1}{3}$ to 1 drop.

Compound powder of elaterium : dose, $\frac{1}{2}$ to 5 grains.

Carbolic acid. Pure it is a caustic. Used in the strength of 1 to 20 or 40 of water. Applied locally it has an anæsthetic action similar but inferior to that of cocaine.

Iodoform—*pulvis iodoformi*.

The following are hypodermic medicines. It is necessary to be provided with a good hypodermic syringe and three sets of needles, &c. (*See Fig. 41.*)

Sulphate of morphia : dose, $\frac{1}{16}$ to $\frac{1}{2}$ grain. To relieve pain.

Apomorphine : dose, $\frac{1}{25}$ to $\frac{1}{6}$ grain. A powerful emetic.

Elaterium : dose, $\frac{1}{16}$ to $\frac{1}{2}$ grain. Acts powerfully on the liver.

Ether, hypodermically, 20 drops. In a case of collapse a teaspoonful may be given.

Pilocarpine : dose, $\frac{1}{16}$ grain. Brings on profuse perspiration.

Cocaine : dose, $\frac{1}{6}$ grain. A local anæsthetic, &c.

In addition, the following are useful medicines :—

Ammonium bromide : dose, 2 to 20 grains, in spasmodic affections of the throat and loss of voice.

Anti-constipation tabloids.

Subnitrate of bismuth : dose, 5 to 30 grains. Used for fermentative disorders of the stomach and for worms.

Bismuth and soda, that is bismuth subnitrate, and soda bicarbonate, of each 3 grains.

Blue pill : dose, 3 grains.

Perchloride of mercury (corrosive sublimate), used in lotions of 1 in 2000 to 4000 of water. This is the most powerful antiseptic. It is soluble 1 in 16 of water. It is also extensively used in dressings for wounds.

Hydrarg. cum creta.—mercury with chalk : dose, $\frac{1}{2}$ to 1 grain.

- Hydrarg. iodidum rubrum (Red Iodide of mercury): dose, $\frac{1}{32}$ to $\frac{1}{8}$ grain.
- Cascara sagrada composita, a good laxative: dose, one before dinner or at bedtime.
- Cathartic compound, strongly purgative.
- Chloral hydrate: dose, 5 to 30 grains. A sleep-producer, but is incompatible with quinine.
- Lead and opium pills: dose, 4 grains.
- Male fern, usually in capsules.
- Citrate of iron and quinine: dose, 3 grains.
- Pepsin: dose, 2 to 5 grains. Has digestive properties.
- Peptonitic: dose, 3 grains. This contains pepsin, pancreatin, lacto-phosphate, and lime in equal quantities. Is a powerful digestive.
- Potassium permanganate: dose, 1 to 5 grains. Has marked deoxidising and disinfecting properties.
- Bromide of potassium: dose, 5 to 30 grains.
- Chlorate of potassium: dose, 10 to 30 grains.
- Iodide of potassium: dose, 2 to 20 grains.
- Compound rhubarb powder (Gregory powder): dose, 20 to 60 grains.
- Santonin: dose, 2 to 6 grains, in sugar or milk. An anthelmintic for round and thread-worms.
- Soda-mint, or neutralising tabloids.
- Tannin.
- Tonic tabloids.
- Voice tabloids of potash, borax, and cocaine.
- Chlorodyne.
- Toothache mixture—menthol 2 parts, butyl chloral hydrate 1 part, carbolic acid 1 part, cocaine hydrochlor 1 part.
- Glycerine.
- Sulphate of copper.
- Nitrate of silver.
- Flowers of sulphur.
- Camphor.
- Liquor ammoniæ.
- Chrysophanic acid.
- Vaseline.

For surgical purposes the following are necessary:—

- Bandages of various sizes.
- Boracic acid.
- Lanolin.

Sterilized catgut ligatures.

Surgeon's lint.

Sterilized gauze.

Oiled silk protective.

Tape adhesive plaster.

A few sticks of nitrate of silver or lunar caustic.

Mustard leaves.

Small dresser's pocket-case, containing scissors, director, catheter, surgical needles, clinical thermometer, bistoury, artery-forceps.

Tourniquet.

Tooth instruments.

Vaccine lymph in tubes.

Brandy or whisky—should be taken in cases of emergency only.

Champagne—useful in treatment of black-water fever.

Wincarnis—useful in cases of great nervous debility and prostration.

APPENDIX NO. III.

EUROPEAN PROVISION ORDER FOR ONE YEAR

THE following is a **suggestive list of provisions suitable for tropical Africa**. They may be supplied by Messrs. Crosse and Blackwell, Soho Square, London ; J. T. Morton, 107 Leadenhall Street, London ; Messrs. Moir & Son, 145 Leadenhall Street, London. A few delicacies have been added for invalids. It has been thought advisable not to add quantities in every case.

Beverages.

Tea. This is a common beverage, owing to the bad water : 20 lbs. in 5-lb. tins. Tea pellets are useful when travelling.

Coffee : that grown in the country, if obtainable, is the best. Ground coffee is preferable to all forms of essence of coffee.

Cocoa or chocolate, useful for its nutritious properties. Cadbury's preparation is the best, as it contains no soda.

Raspberry vinegar, 3 $\frac{1}{2}$ -pint bottles.

Lime-juice, or lime-juice cordial, or lemon squash—never to be used if fresh lemons can be obtained, 3 $\frac{1}{2}$ -pint bottles.

Granular effervescent citrate of magnesia, 2 $\frac{1}{2}$ -pint bottles.

Soda-water, lime-water, or sherbet, 4 $\frac{1}{2}$ -lb. bottles.

Soups.—Such as julienne, vegetable, ox-tail, hare-soup, 3 of each in 1-lb. tins.

Fish.—Such as salmon, 6 1-lb. tins, herrings à la sardine 3 1-lb. tins, oysters 6 $\frac{3}{4}$ -lb. tins, sardines 6 $\frac{1}{4}$ -lb. tins. Fresh fish, even if coarse in fibre and of indifferent flavour, is to be preferred to tinned fish.

Meats.—Various, in 1-lb. tins.

Chicago compressed beef or ham.

Smoked breakfast bacon or whole hams.

Paysandu ox tongues, lunch tongues, or sheep's tongues,

potted ham and tongue, potted ham and chicken, in 3-oz. tins, 3 of each.

Anchovy paste, 2 in 3-oz. tins.

Liebig's extract of meat, 6 1-oz. pots. Bovril.

Essence of mutton, beef, or chicken jelly, 3 in $2\frac{1}{2}$ -oz. tins.

Vegetables.—Various. Only to be used if fresh vegetables are not to be had. Chollet's compressed mixed vegetables for soup.

Cheese.—If desired.

Condiments and relishes.

Curry powder, 3 $\frac{1}{2}$ -lb. bottles.

Madras chutney, 3 1-pint bottles.

Colman's mustard, 6 $\frac{1}{2}$ -lb. tins—may be required for poultices.

Ground white pepper, 3 small tins.

Cayenne pepper, 3 1-oz. castors.

Lea & Perrins' Worcester sauce, 6 small bottles.

White table vinegar, 3 $\frac{1}{2}$ -pint bottles.

Salad oil, 1 $\frac{1}{2}$ -pint bottle.

Sweet almond oil, 1 $\frac{1}{2}$ -pint bottle.

Salt, 20 1-lb. packets in hermetically sealed tins.

Fruits in syrup.—Various, such as—

Pears, in $2\frac{1}{4}$ -lb. tins.

Peaches, in $2\frac{1}{4}$ -lb. tins.

Raspberries, in 1-lb. tins.

Strawberries, „ „

Dried fruits.

Imperial French plums.

Elme figs.

Dates.

Crystallised ginger.

Jams.—Various.

Bottled fruits for tarts.—Various.

Gelatine.

Portable table jellies.

Biscuits.—Various—Huntley & Palmer's are the best.

Plain biscuits, such as "water," and "soda," often take the place of bread on the march.

Baking and cooking.

Flour, say 126 lbs. in 9 14-lb. tins.

Sugar, say 70 lbs. „ 10 7-lb. „

Oatmeal, 21 lbs. „ 6 4-lb. „

Marrow fat, 16 lbs. „ 8 2-lb. „ Of the above, together with

tea, the largest supply of all the provisions is necessary.

Butter—if desired.

Condensed milk—if desired.

Sago, tapioca, vermicelli.

Rice—may frequently be bought in the country.

Arrowroot or corn-flour—6 1-lb. tins.

Barley, 10 lbs. in 5 2-lb. tins.

Split lentils, 4 lbs. in 4 1-lb. tins.

Hops, 4 $\frac{1}{2}$ -lb. packets in sealed tins.

Baking-powder, 6 1-lb. bottles ; bicarbonate of soda, 3 $\frac{1}{2}$ -lb. bottles ; tartaric acid, 3 $\frac{1}{2}$ -lb. bottles.

Cloves, 1 $\frac{1}{2}$ -lb. tin.

Mixed spice, nutmeg, orange peel, senna leaves, sultana raisins, currants.

Dried mint, 1 $\frac{1}{4}$ -pint bottle.

Dried parsley, 1 $\frac{1}{4}$ -pint bottle.

Golden syrup, 6 1-lb. tins.

Saltpetre for pickling beef or pork, $\frac{1}{2}$ lb.

Miscellaneous.

Soap, brown soap, say 20 lbs.

Carbolic.

Toilet.

Soft soap.

Blue.

Starch.

Borax, beeswax.

Candles, 30 lbs.

Matches, 1 gross.

Blue black ink, 2 bottles.

Gum.

Nubian blacking.

Knife polish.

Washing soda.

Keating's insect powder, 3-lb. tins.

Lump camphor, 1 lb.

Glycerine, 1 small bottle.

Linseed meal, 2 1-lb. tins.

Carbonate of ammonia, 1 bottle

Spirits of wine, small quantity

2 provision-opening knives.

Nail-puller.

2 corkscrews.

The following **native and fresh food stuffs** are to be found in most parts of the continent, and are, when well cooked, to be preferred to tinned provisions.

Meats.—Beef, mutton, kid are frequently to be had, and fowls are always obtainable. The Africa nkuku (fowl), while small in size, is most delicate. Ducks, guinea-fowl, pigeons, partridges, as well as venison, are to be had occasionally. Pigs do remarkably well on the hills. River and lake fish are plentiful at certain seasons.

Vegetables.—Sweet potatoes, yams, beans, peas, and pumpkins are in abundance. European potatoes should be cultivated by every settler, and do well. Green Indian-corn, boiled with milk or roasted in the ashes, is excellent and most nutritious; casava in its season, when boiled in several waters and fried, resembles European potatoes.

Green bananas, of varieties well known to the natives, are excellent when roasted in the ashes. They may also be boiled. The fruit of the papaw (*Carica Papaya*), when green, is an excellent vegetable, and resembles vegetable marrow.

The native mtaka (a kind of spinnage) is excellent.

Tomatoes grow everywhere.

Fruits.—Native and foreign fruits in their season are good. Lemons, pine-apples, melons, papaws, Cape gooseberries, bananas (of which there are thirty varieties) form an excellent variety.

The banana and plantain may be used as a vegetable, as a fruit, as flour, or as a wine.

Flour.—Indian-corn flour can be used in the hot season instead of oat-meal. It should always be cooked with milk. It is good also for puddings and fritters, and resembles ground rice. Banana flour is excellent for porridge and for thin gruel.

Bean flour cooked with milk makes a most nutritious food.

Pea-flour is also excellent.

APPENDIX NO. IV.

GENERAL OUTFIT

THE following is a suggestive list of clothing, household utensils, and furniture. Africa is a continent, and embraces hot plains, undulating cool plateaux, and cold highland country. Every resident or traveller must therefore select according to the requirements of the country about to be visited. The goods may be supplied by Messrs. Silver & Co., Cornhill, London, or the Army and Navy Stores, London. The india-rubber material may be supplied by the Argyle Rubber Co., 64 Gordon Street, Glasgow.

PERSONAL CLOTHING.

Suits.—One dozen white drill, such as are made at Zanzibar (C. R. de Souza, Portuguese Street, Zanzibar). Flannel tennis suits may be selected by some. Two light tweed suits, such as are worn in Europe during the spring and autumn. Some prefer *knickerbockers* of woollen material. All clothing for the tropics should be unlined.

Sleeping garments or pyjamas.—It is often so hot in the tropics, that in the early hours of the night the bed-clothing cannot be borne, whereas about four in the morning the temperature falls, and exposure may result in a chill. Silk and wool, or grey shrunk flannel, is the best material.

Shirts may be made of Jaeger's fine flannel, silk and wool, or white union shirting. The last named is a mixture of cotton and wool ; it is inexpensive, unshrinkable, and washes well. White cellular garments for hot weather may be selected by some in preference. White dress shirts may be required in certain localities.

Drawers may be made of calico or light woollen material. They should be short and loose.

Waistcoat.—Those who do much hunting will require one

which should be made of chamois leather. A sleeved waistcoat may be preferred.

Stockings.—Several pairs of knitted woollen material should be taken for the march. Socks of cotton, cashmere, or silk are excellent for the hot season.

Handkerchiefs—of white linen or red silk.

Towels.—Six bath, and six hand towels.

Kāmārbānd.—A few of silk may be preferred by some ; for ordinary wear two yards of fine cloth or flannel wound round the waist afford an excellent protection to the abdomen.

Braces.—A few pairs.

Helmets.—This is a very important item. They should be light in weight, with a broad brim, and made so that they afford shade to the back of the neck. The Terai hat is excellent, and should be of double felt. Smaller hats of soft material should be chosen, and at least two caps for knock-about wear.

Boots.—Brown shooting-boots for heavy wear. Have them made to order, of the best russet leather, and a little larger in size than those worn in Europe, as an allowance for the heat. Shoes are excellent for lighter wear. Veldtschoons are useful for knock-about use. Spare laces and dubbin should not be overlooked. White cloth or leather slippers are chosen by some.

Leggings may be selected according to taste, so too may light cloth gaiters.

Putties are usually of light woollen material, and grey in colour.

A light woollen dressing-gown is most necessary.

Overcoat of light tweed is useful for the cold chilly weather of the highlands ; or a light, sleeveless, Inverness cloak may be the choice of some.

Waterproof-coat should be made of the best of mackintosh, and of light texture. It should be sewn, and not put together by adhesive material.

India-rubber bath is excellent for the march.

Hot-water bottles.—These are an absolute necessity for Africa. They are indispensable in the treatment of malarial fever. Three at least should be taken. Make certain that the screw at the neck will not become loose and lead to leaking, in which case the bottle is useless.

- Housewife**, containing needles of various sizes, thread, buttons, a bodkin, palm and sail needles, tapes, &c.
- Holdall, or dressing-case**, containing brushes for the hair, nails, and teeth; scissors, comb, hand-glass, soap, and sponges.
- Shaving instruments**, as two razors, soap-brush, strop, &c.
- Traveller's pocket-knife**, containing cork-screw, tin-opener, screw-driver, &c.
- Mackintosh sheeting** of the best quality, and yet not heavy. Let it be 2 yards square.
- India-rubber tubing**, $\frac{3}{4}$ -inch diameter and 2 yards long, for giving a hot-air bath and inducing free perspiration in fever.
- Umbrellas**.—White, lined with green. A few spare covers should be taken.
- Lump camphor**.—Sewn in cloth and placed in boxes to keep away moths.

TRAVELLING AND HOUSEHOLD UTENSILS

The following is a suggestive list of articles necessary for travelling. All residents and planters should surround themselves with as many household comforts as possible. A good library stocked with choice literature, favourite authors, and a few of the best novels is invaluable to health.

Tent.—If there is much travelling in the interior a tent is a necessity. Those of Edgington, London, are by universal consent the best. It should have a fly and a ground sheet, and should be of the very best material. Only the best of everything can stand the tear and wear of a rough country like Africa.

Canteen.—This should contain all the necessities for a kitchen in the shape of cooking-pots, goblets, gridirons, knives, &c. It should contain everything suitable for a table, as enamelled plates, cups, saucers, table-knives, forks, spoons. It should contain a teapot, coffee-pot, and dishes for salt, pepper, mustard, &c.

A canteen is a necessity for all travellers in the country; if, however, residence (as in coffee-planting) is contemplated, then the ordinary kitchen furnishings should be procured, together with a stove, such as the "Victoress." Tea services, dinner services, &c., must be

selected according to requirements and taste. Enamelled ware is the best for ordinary purposes.

Bedstead.—Some prefer the ordinary folding iron bedstead for the march. My experience, however, is that the natives, not understanding joints, bring the whole thing to grief in a few weeks. It is better to get a cross-legged bedstead made at home of good $2\frac{1}{2}$ -inch pine wood, which should be $6\frac{1}{2}$ feet long, with the crossed legs made to fit in below. It should be covered with the strongest sailors' canvas, and when stretched should be 2 feet 8 inches broad. It is beyond the power of the native to break this, and is an ordinary load for a carrier.

Valise or "bed."—This is a giant hold-all. It should be made of strong waterproof canvas, and not of waterproofing only, as the perspiration of the native in carrying affects the mackintosh. It should be $6\frac{1}{2}$ feet long and 3 feet broad, with flaps at the sides of thinner waterproof material $2\frac{1}{2}$ feet broad each. There should also be end flaps of the same thin material, and also $2\frac{1}{2}$ feet broad. It should be sewn throughout. This valise should contain all bedding furnishings, such as—

- (1) **A hair mattress** to suit the bedstead. It should be $1\frac{1}{2}$ inches thick, as when laid on the canvas stretcher this will be enough. If the mattress is of the ordinary thickness, the "bed," when rolled up, will be bulky and cumbersome.
- (2) **A mosquito-curtain.**—This may be bell shaped, so that the apex can be suspended from a hook. The square pattern is most useful.
- (3) **Two of the best Austrian or Jaeger blankets.** In cold districts more may be required.
- (4) **Two white sheets.**
- (5) **Two small hair-pillows** with pillow-slips. Down pillows are too hot.
- (6) **A valise pillow** for holding clothes and sleeping garments.
- (7) **A waterproof ground sheet,** 6 feet long by 5 feet broad.
- (8) **An india-rubber basin.**

The whole valise should weigh not more than 55 lbs.

Folding Amer table, table-cloths, and table-napkins.

Folding-chairs, for household purposes. The bent wood furniture is excellent for Africa.

Machilla, or hammock, made of the strongest canvas, with

rope at either end, which can be utilised for slinging on a pole or for sleeping purposes.

Water-bottle, for the journey. Usually made of ebonite and covered with felt.

Lantern.—The best that is made, and suitable for oil or candles.

A table-lamp.—Those of the Hitchcock or Wandzer patterns are best, as they need no glass funnels (oil is to be had at most of the European stores in the country).

Candle lamps.

Zinc baths are most useful.

Filter. The pocket-filters are of little use. Every resident should have a large kaolin filter on the Chamberland-Pasteur principle, which consists of porous tubes of porcelain.

The Colonial leather waist-belt may be necessary for hunting. It has a strap to go on the right shoulder, a means of holding a light revolver, a knife, and ammunition. In this connection the following are necessary accessories: flint and steel, bi-convex burning-glass, whistle, &c.

Miscellaneous.—The following may be found useful:—

Field-glasses.

Compass.

Clinical thermometer, for taking the temperature in fever.

Ordinary thermometer.

Blue-coloured glasses.

Spring balance.

Letter weights.

Tape-measure.

Small handcase of tools, with screws, nails, tacks, and a small hammer.

Fish-hooks, chess, &c.

A few tricks for amusing the natives. Street toys amuse and break down the fear and prejudices of the people.

A tin japanned despatch-case, containing—

Journals.

Diaries.

Writing-paper, &c.

Envelopes.

Pens.

Pencils.

Maps.

Ink-bottle.

Ink in pellets.

Ink erasure.

Stylographic pen.

Sketching materials.

Drawing paper and utensils.

Travelling trunks.—As most of the transport in Africa has to be done by native carriers, the boxes should not exceed, when packed, more than 50 or 60 lbs. All personal clothing should be packed in tin japanned air- and water-tight boxes, with the lock outside. For convenience, all the boxes should have the same lock, so that one key fits all. Those supplied by Messrs. Silver & Co., Cornhill, London, are excellent, and the most convenient size for general purposes is $32 \times 14 \times 10$.

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